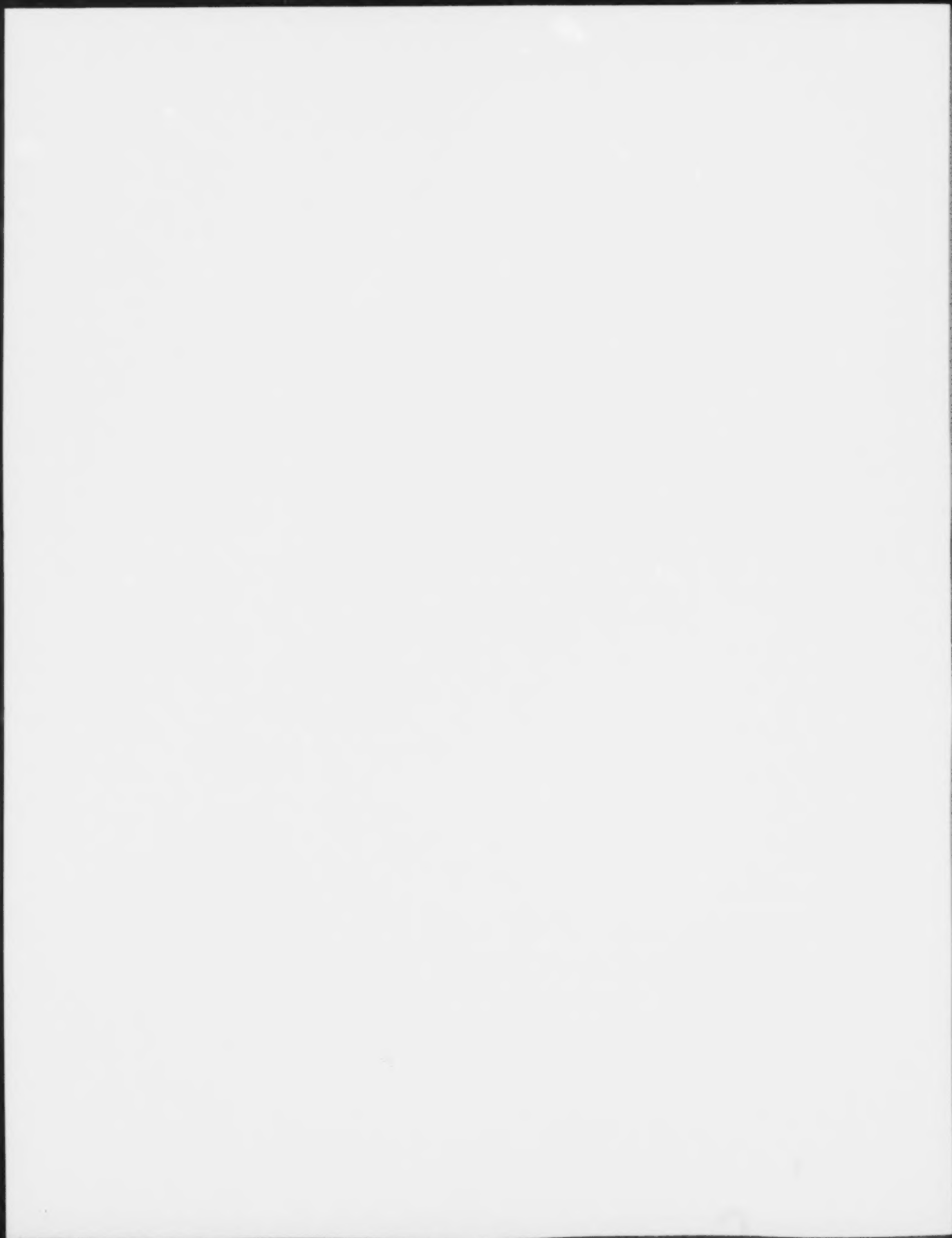


FISHERIES AND OCEANS CANADA
HUMAN USE OBJECTIVES AND INDICATORS
FRAMEWORK FOR INTEGRATED OCEAN
MANAGEMENT ON THE SCOTIAN SHELF

FINAL REPORT
PROJECT NO. NSD19186



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**DEPARTMENT OF FISHERIES AND OCEANS
OCEANS AND COASTAL MANAGEMENT DIVISION**

**HUMAN USE OBJECTIVES AND INDICATORS
FRAMEWORK FOR INTEGRATED OCEAN
MANAGEMENT ON THE SCOTIAN SHELF**

FINAL REPORT

**Jay Walmsley
Jacques Whitford Limited
3 Spectacle Lake Drive
Dartmouth, NS B3B 1W8**

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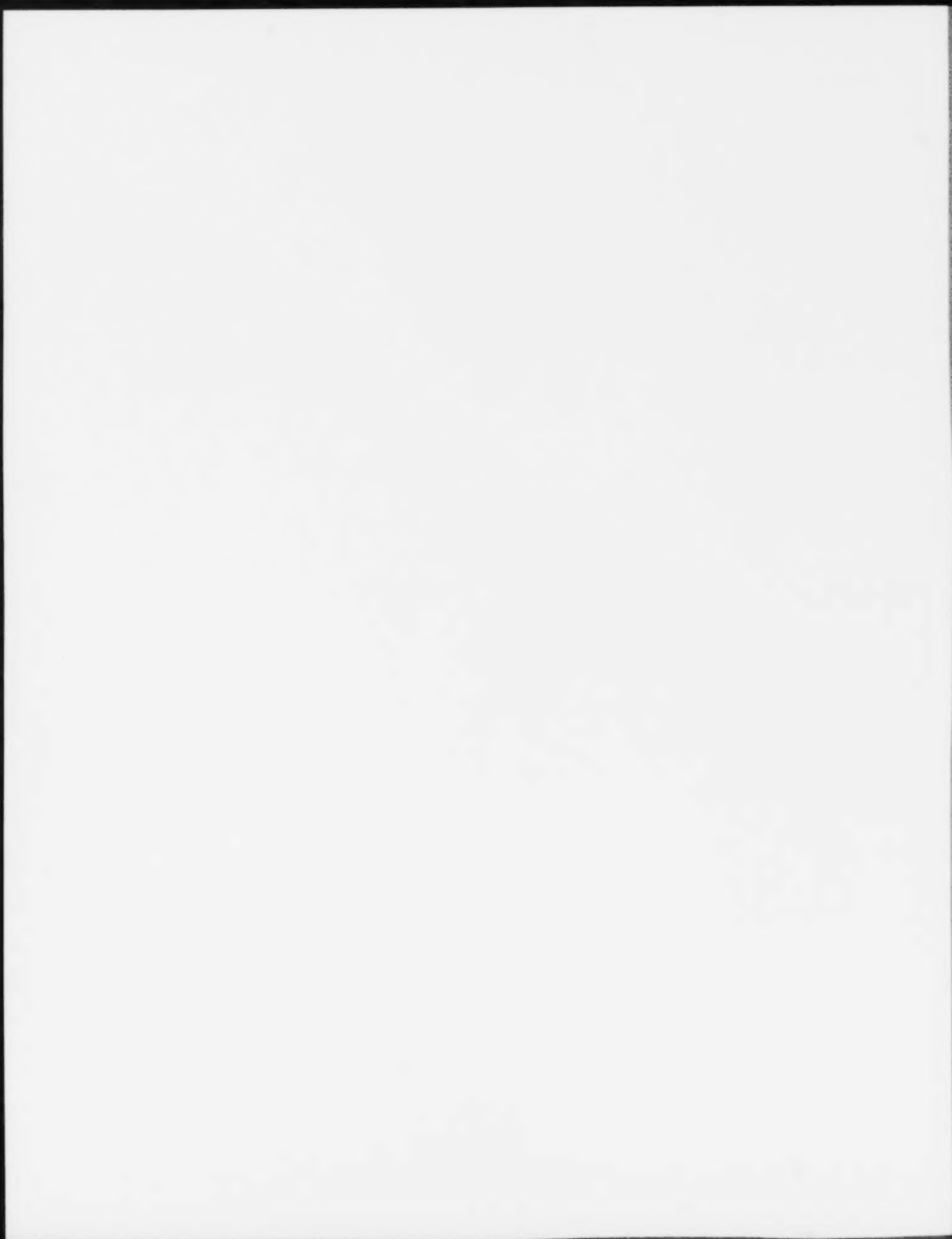


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1.0 INTRODUCTION

Under the 1997 *Oceans Act*, Fisheries and Oceans Canada (DFO) is required to lead and facilitate the development of integrated management plans for Canada's oceans. Integrated management is a process aimed at addressing the multiple and potential competing uses in the oceans, while considering impacts from these activities at an ecosystem level. According to *Canada's Oceans Strategy*, it is "a collaborative approach that cannot be forced on anyone; and a flexible and transparent planning process that respects existing divisions of constitutional and departmental authority, and does not abrogate or derogate from any existing Aboriginal or treaty rights" (DFO 2002).

One of the integrated management projects is the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative. Through ESSIM, DFO is working with a range of stakeholders to develop and implement an integrated ocean management plan on the Scotian Shelf (ESSIM Plan). As part of the ESSIM Initiative, DFO has undertaken a program to develop a set of objectives and related indicators for ecosystem-based management. This includes the development of a framework, objectives and indicators that relate to the ecosystem or ecological aspects of the system, as well as the development of the same for human use of the resource. The human use aspects include social, economic and institutional (governance) components of ecosystem-based management, an area that has received little attention internationally (Walmsley 2004).

In order to achieve their objectives, in 2003 DFO established a multi-stakeholder working group to develop a framework for human use objectives and indicators. It was envisaged that the Human Use Objectives Framework would be integrated into the Plan along with the Ecosystem Objectives Framework that was being developed concurrently, forming a complementary integrated framework for monitoring and evaluation of ecosystem-based management of the Scotian Shelf. The working group made significant progress in selecting human-use elements and identifying broad scale objectives and potential indicators (see Appendix A).

The aim of this project is to build on the work of the working group and to develop a framework for human use objectives and indicators that will form part of the ESSIM Plan. This document describes the methodology used and details the framework, objectives and indicators developed, as well as recommendations for future action.

2.0 APPROACH TO THE STUDY

The purpose of the project was to advance the work of the ESSIM multi-stakeholder working group and to develop the human-use objectives and indicators framework to the extent that it could be integrated into the ESSIM Plan along with the ecosystem objectives framework. To achieve this, three main tasks were undertaken:

- Evaluation of the framework proposed by the working group;
- Organisation of a stakeholder workshop; and
- Development of a human use objectives framework within the management context of the ESSIM Initiative.

2.1 Evaluation of the Framework Proposed by the Working Group

The Human Use Objectives Working Group is a sub-group of a multi-stakeholder planning group that formed in the spring of 2003 to develop a prototype integrated management plan for a selected ecosystem sub-unit in the Eastern Scotian Shelf planning area (*i.e.*, Sable-Banquereau and the Slope waters). The Working Group was tasked to develop socio-economic, cultural and institutional (governance) objectives and indicators as monitoring and performance measures for the ESSIM Plan. The Working Group developed a hierarchical framework for objectives and indicators and began by "unpacking" the high-level management objectives that were outlined in the ESSIM *Strategic Planning Framework* (DFO 2003). A summary of the results from the Human Use Working Group is presented in Appendix A.

The proposed framework was assessed within the context of current advances in objective and indicator development in Canada and elsewhere (*e.g.*, Anielski 2001; Anielski *et al.* 2002; Charles *et al.* 2002; Barbière 2003; Pomeroy *et al.* 2003; DFO and DFA 2004; Stahl and Farrel 2004). In particular, the outcomes from the Working Group were compared to those from the concurrent work being undertaken under ESSIM to develop ecosystem objectives and indicators. In addition, the proposed human use objectives framework was evaluated from a management perspective, particularly with regard to implementation and adaptive management.

Based on the findings of the assessment, the proposed framework was modified with the aim of providing input into the workshop.

2.2 Stakeholder Workshop

A workshop was convened on December 1-2, 2004 at the Bedford Institute of Oceanography specifically to obtain expert opinion from an array of stakeholders including government managers,

industry, academic/technical experts, community and non-government organisation (NGO) representatives. The objectives of the workshop were to:

- Assess the proposed framework as a logical model to organize objectives and indicators;
- Assess proposed objectives using evaluation criteria based on requirements for the integrated management of the Eastern Scotian Shelf; and
- Identify a set of key indicators for the social, economic and institutional components of the framework, where possible at a sectoral level.

The results of the workshop are presented in Appendix B.

2.3 Development of Human Use Objectives Framework

A Human Use Objectives Framework was further developed, along with a set of objectives and indicators, based on:

- The ESSIM vision and guiding principles;
- The framework proposed by the Human Use Working Group (see Appendix A), and the resultant assessment;
- The results of the workshop (Appendix B); and
- Other Canadian and international indicator initiatives (e.g., Anielski 2001; Fraser Basin Council 2001; Anielski *et al.* 2002; Charles *et al.* 2002; Pomeroy *et al.* 2003; DFO and DFA 2004; Meter 2004; Walmsley 2004).

The intention was to develop a goal-oriented management approach, linked to an appropriate reporting framework.

2.4 Recommendations for Integration Into the ESSIM Plan

In conjunction with DFO, and taking into account stakeholder comments at the workshop, recommendations were made on several issues. These included:

- The role of stakeholders in the implementation of objectives.
- Integrating the Human Use Objectives Framework with the Ecosystem Objectives Framework for the ESSIM Plan; and
- Use of indicators, their interpretation, data access and management and identification of draft indicators.

3.0 HUMAN USE OBJECTIVES AND INDICATORS FRAMEWORK

The Human Use Objectives Framework is a hierarchical framework, with two main components (Figure 3.1):

- An objectives-based management system; and
- A reporting system.

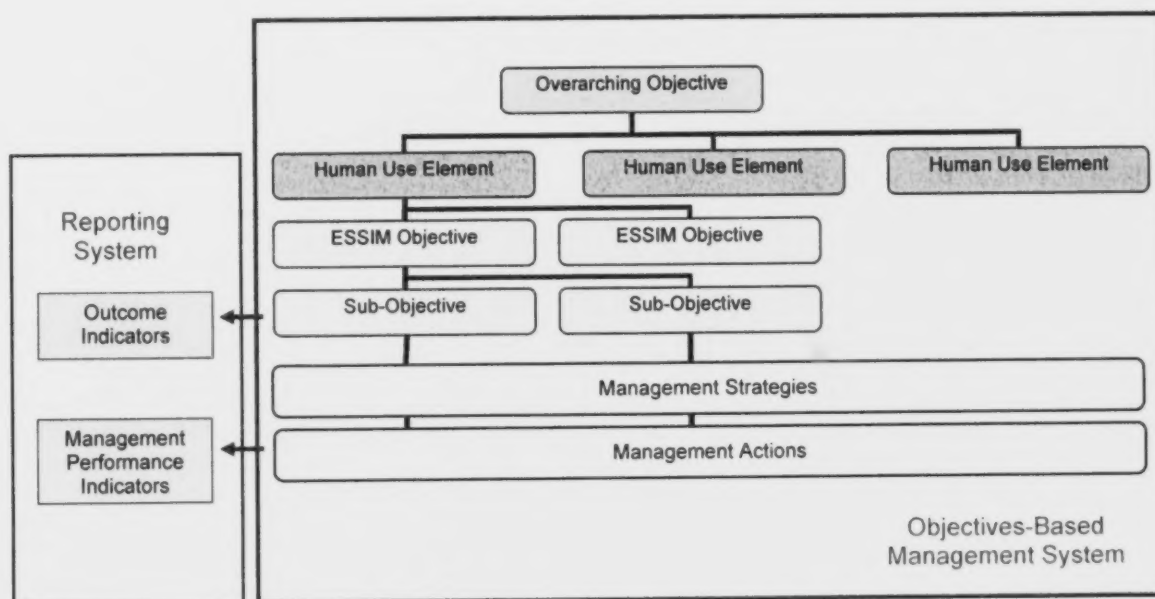


Figure 3.1 Human Use Objectives Framework

3.1 Objectives-Based Management System

ESSIM supports the development of an ecosystem-based approach to ocean management. This implies a goal oriented management system that ensures planning, development and management of marine resources in a manner that addresses the multiple needs and desires of society, without jeopardizing the options for future generations to benefit from the full range of goods and services provided by the Scotian Shelf. Thus, the system requires objectives, not only to address the need for functional, healthy ecosystems, but also to address the issues surrounding human use of the resource.

The framework outlined below, although complementary to the Ecosystem Objectives Framework, deals only with the human use aspects, including social, economic and institutional management. As shown in Figure 3.1, the objectives-based management system has six tiers including:

- **An overarching objective** – a high-level, conceptual objective that provides the foundation for development of all other objectives and outlines the principles upon which ESSIM objectives and sub-objectives are chosen. In a sense the overarching objective provides a vision for ESSIM with regard to the social, economic and institutional aspects as they relate to ecosystem-based management. The overarching objective is considered to be at the same level as the national ecosystem objectives ("Dunsmuir objectives") of the Ecosystem Objectives Framework.
- **Human use elements** – Recognised components for which objectives need to be developed in order to include all aspects expressed in the overarching objective.
- **ESSIM objectives** – these are developed for each of the human use elements. They express a purpose or goal toward which ESSIM should aim in order to achieve the overarching objective.
- **Sub-objectives** – these provide operational objectives at a lower level to the ESSIM objectives. They are expressed as outcomes and identify components of the ESSIM objectives that require management, or that will contribute to the human use of the ocean space and resources of the ESSIM area.
- **Management strategies** – management strategies are the methods by which ESSIM will achieve the ESSIM objectives and sub-objectives. Due to the integrated nature of the ESSIM planning process, management strategies are not linked to only one sub-objective, but may meet the requirements of two or more sub-objectives.
- **Management actions** – actions undertaken in order to implement the management strategies. Management actions are often linked to a timeframe within which they should be implemented.

3.2 Reporting System

The reporting system provides a method to evaluate successful implementation of management actions and reflects progress towards the ESSIM objectives and sub-objectives. The reporting system is indicator-based. It has two main types of indicators: outcome indicators and management performance indicators.

3.2.1 Outcome Indicators

Outcome indicators provide a measure of the success of the ESSIM management strategies by quantifying the level of improvement in the human use system and assessing to what degree the objectives have been met. Outcome indicators fit the OECD definition of an indicator which is: "a parameter that provides information about an environmental issue with significance that extends beyond the parameter itself" (OECD 1993).

Within the Human Use Objectives Framework, the outcome indicators are directly linked to the ESSIM sub-objectives, and monitor progress towards meeting each sub-objective over time. They may not cover all aspects of each sub-objective, but should provide a good indication of the direction in which the system is moving.

3.2.2 Management Performance Indicators

Management performance indicators provide an evaluation of the level of implementation of the management strategy through management actions. They provide an assessment of the degree to which management actions have been carried out within a given time limit.

4.0 OBJECTIVES AND INDICATORS

The aim of this project was to develop objectives and indicators as part of the Human Use Objectives Framework and did not include the development of management strategies and actions, or management performance indicators. It included:

- Defining the overarching objective and identifying human use elements;
- Developing ESSIM objectives and sub-objectives; and
- Recommending appropriate outcome indicators.

Each of these elements is discussed below.

4.1 Overarching Objective

The overarching objective is:

To contribute to social, cultural and economic well-being by achieving ecologically sustainable and integrated use of the ocean space and resources in the ESSIM area.

The intention of the overarching objective is that ESSIM primarily contribute to the overall well-being of communities within Nova Scotia. This does not mean that integrated management of the ESSIM area will not have benefits outside Nova Scotia, but rather that the focus is on communities in Nova Scotia. These consist of all coastal communities including First Nations communities, fishing communities and urban communities such as Halifax or Sydney.

The two ESSIM principles reflected in this overarching objective include:

- **Ecological sustainability**, which is the ability of an ecosystem to exist in such a way that life-supporting processes can infinitely support all organisms in a healthy, continuous way. It ensures the preservation of natural life support systems (habitats and ecosystems) and the maintenance of biodiversity through achieving a 'natural' extinction rate (species). In order for the Scotian Shelf to remain ecologically sustainable, the use of living resources should be within the carrying capacity of the ecosystem and pollution should not exceed the ecosystem's assimilative capacity.
- **Integrated use**, which implies that multiple use of the ocean space and resources will be managed in a co-ordinated manner so that no single activity is seen outside the context of other users. Integrated management is defined by DFO (2003) as "a comprehensive and co-ordinated approach to planning and decision-making for sustainability, based on the balanced consideration of the full range of interests and environmental, social, cultural, economic and institutional objectives for a management area".

4.2 Human Use Elements and ESSIM Objectives

The human use elements that contribute to the overarching objective are:

- Community well-being;
- Economic well-being;
- Industrial capacity and assets; and
- Integrated management process.

A single ESSIM objective has been developed for each human use element listed above (Table 4.1). A discussion of each objective is provided below.

Table 4.1 Human Use Elements and Related ESSIM Objectives	
Human Use Element	ESSIM Objective
Community well-being	To contribute to the long-term social and cultural well-being of communities in Nova Scotia
Economic well-being	To generate wealth through activities related to the ocean system and distributed according to societal objectives
Industrial Capacity and Assets	To support commercial activity and other non commercial uses within the bounds of resource capacity, while incorporating a culture of resource stewardship
Integrated Management Process	To develop institutional arrangements and capacities, and appropriate management strategies and actions that contribute to integrated ocean management

4.2.1 Community Well-Being: To Contribute to the Long-Term Social and Cultural Well-Being of Communities in Nova Scotia

This ESSIM objective encompasses the general well-being of people in Nova Scotia. Well-being can be defined as "experience of a good quality of life". According to Wilkinson (1991), well-being is a concept meant to "recognize the social, cultural and psychological needs of people, their family, institutions and communities". In many instances, well-being encompasses economic well-being as well as social and cultural. However, this ESSIM objective covers the social and cultural well-being only.

Social well-being is related to aspects such as social structures (cohesion and interrelationships; political structures and institutions), education levels, health, safety and security, public infrastructure and social services. Culture is defined as the way of life of a group of people including the behaviours, beliefs, values, and symbols that they accept, generally without thinking about them, and that are passed along by communication and imitation from one generation to the next (<http://www.tamu.edu/classes/cosc/choudhury/culture.html> 2004). Often, if the social well-being of a community is assured, the cultural well-being is also assured.

This ESSIM objective is primarily focused on communities within Nova Scotia, although it does not preclude benefits from accruing to Canadians outside the province. A community may be defined as a social group of any size whose members reside in a specific locality, share government and often have common cultural and historical heritage. Identification of community boundaries still remains elusive in

many cases, particularly in urban settings. In Nova Scotia, however, some communities are well-defined and may be able to be used as proxies for Nova Scotian communities in general (e.g., First Nations, fishing communities etc.).

4.2.2 Economic Well-Being: To Generate Wealth Through Activities Related to the Ocean System and Distributed According to Societal Objectives

It is envisaged that ESSIM will contribute to wealth generation in Nova Scotia and in Canada generally through use of the ocean space and resources (living and non-living). Wealth is considered to be anything of value, including both monetary and non-monetary assets, and tangible and intangible benefits. Another term for wealth may be *net benefits*, as *wealth* implies that both costs and benefits have been taken into account. Kunte *et al.* (1998) define wealth broadly as consisting of natural capital (natural resources); human capital (human resources and knowledge); social capital (interrelationships), and manufactured capital (machinery, equipment, etc.).

This objective is strongly linked to community well-being, particularly in that ESSIM aims to contribute to the distribution of wealth according to societal objectives. However, the term *societal* refers to the broader society, in Nova Scotia and Canada, and may not be linked to *community* well-being only. These societal objectives are currently not clearly defined, but it is assumed that ESSIM will influence equitable distribution of wealth through the process of changing priorities, both in government, industry and the broader population. In order to meet societal objectives, wealth needs to be retained within communities or within Nova Scotia.

Implicit in this ESSIM objective is the requirement that, in order to conform to the overarching objective, wealth should be generated sustainably, *i.e.*, now and in the future. This means that any renewable resource use should be within the carrying capacity of the ecosystem; that non-renewable resources should be utilized at an economically viable level over a reasonable period, and that pollution should not exceed the assimilative capacity of the ocean.

ESSIM can contribute to sustainable wealth generation by ensuring that information is available to regulators with regard to the carrying or assimilative capacity of the system. Additionally, ESSIM can influence the retention of intrinsic, intangible wealth in the form of protection or conservation of natural capital (e.g., Sable Island; MPAs) and ensure that value is placed on natural capital.

4.2.3 Industrial Capacity and Assets: To Support Commercial Activity and Other Non-Commercial Uses Within the Bounds of Resource Capacity, While Incorporating a Culture of Resource Stewardship

The focus of this ESSIM objective is on commercial activity, although it is recognized that non-commercial uses may have a cumulative effect that needs to be taken into account when determining resource capacity. It is based on the understanding that the ocean is a multi-use environment, with many offshore uses having commercial value.

There are three elements incorporated in this objective:

- Developing capacity in the ocean use sectors to make full use of the resources available, while minimizing conflict between users. This will require an understanding of the various activities and the requirements of the different sectors.
- Ensuring that there is not excess industrial capacity that will impact negatively on the ecological sustainability of the resources of the ESSIM area. As expressed in the overarching objective, use of ocean resources should be sustainable, *i.e.*, within the carrying capacity of the resources.
- Promoting an understanding of how resource stewardship can contribute to the maintenance of viable resources in the long-term. Resource stewardship calls upon all ocean users to assume responsibility for protecting the integrity of ocean resources and ecosystems. A culture of resource stewardship is developed as individuals and organizations realize the need for conservation of resources and minimization of pollution. This is developed over time and eventually becomes ingrained in the norms and mores of the industry or communities.

ESSIM can influence all three of these elements through provision of information and facilitation. Industrial capacity will, however, mainly be dependent on the economic viability of an industry.

4.2.4 Integrated Management Process: To Develop Institutional Arrangements and Capacity, and Appropriate Management Strategies and Actions That Contribute to Integrated Ocean Management

Integrated management is intended to be the cornerstone of the ESSIM Initiative. This objective differs from the other objectives as it provides the processes and institutional platforms by which all of the other program objectives are met. It is, thus, critical to the success of implementing ESSIM.

There are several components related to this objective, including:

- An interactive networking system of formal and informal structures within which relevant organizations and stakeholders exercise their responsibilities in the management and use of ESSIM area marine resources. This will be achieved through the development of collaborative planning structures that have the co-operation of all regulatory bodies that are part of ESSIM, as well as stakeholder and Nova Scotian community participation.
- The availability of a series of stakeholder-developed documents that explain how marine resources within the ESSIM area will be managed and how respective stakeholders are expected to carry out their activities. These will include documents on policy, planning, guidelines and relevant regulations and practices.

- The presence of relevant legislation and a management system that ensures that all applicable legal principles and responsibilities are evaluated and applied. This should also include a system to monitor compliance of both users and regulators.
- The presence of an effective communication system by which the public and stakeholders are made aware of, and are able to understand, ESSIM in terms of the decisions made, activities undertaken and their societal implications.
- The presence of a management system that is continually evaluating the multi-dimensional aspects of the ESSIM marine area, and adapting policies, plans, guidelines, budgets and practices to meet the demands created by such changes.

4.3 ESSIM Sub-Objectives and Indicators

Table 4.2 summarises the sub-objectives chosen for each human use element and ESSIM objective, and shows recommended outcome indicators for each sub-objective. Fact sheets for each sub-objective are presented in Appendix C, where the following information is provided:

- Definition;
- Description of the issue and the relevance to ESSIM;
- Recommended outcome indicators;
- Linkages with other frameworks, human use elements or objectives; and
- Possible problems or concerns.

There are currently eighteen sub-objectives that reflect requirements of the four ESSIM objectives. There are several indicators for each of these, with a total of 63 indicators that are recommended to be included in the framework.

Table 4.2 ESSIM Objectives, Sub-Objectives and Indicators			
Overarching Objective: To contribute to social, cultural and economic well-being by achieving ecologically sustainable and integrated use of the ocean space and resources in the ESSIM area			
Human Use Element	ESSIM Objective	Sub-Objective	Outcome Indicators
Social and Cultural			
Community well-being	To contribute to the long-term social and cultural well-being of communities in Nova Scotia	Access by coastal communities and all Nova Scotians to sustainable livelihood opportunities derived from ocean resources	Provincial employment levels per sector (no. of people)
			Legal requirements for access per sector (qualitative explanation)
			Number of licenses issued per sector (no./sector)
			Capital outlay and operating costs per sector per annum (\$/annum)

Table 4.2 ESSIM Objectives, Sub-Objectives and Indicators

Overarching Objective: To contribute to social, cultural and economic well-being by achieving ecologically sustainable and integrated use of the ocean space and resources in the ESSIM area					
Human Use Element	ESSIM Objective	Sub-Objective	Outcome Indicators		
		Nova Scotian community resilience	Reported bankruptcies in pilot communities (no.)		
			Debt levels per annum in pilot communities (\$)		
			Marine fisheries landed value by type of fish in pilot communities (\$/per type)		
			Age structure of community in pilot communities (years)		
			Income from economic activities (\$/activity)		
		Ocean-related education, training and awareness enhanced	Percentage of children at high school level who have understanding of ocean-related issues (%)		
			Number of ocean-related curriculum elements at elementary, junior high and high school levels by school board (no.)		
			Number of graduates (bachelors, masters, doctoral) from recognized ocean-based university courses (no./annum)		
			Number of certificates issued through approved training courses (no./annum)		
			Number of public communications with regard to ESSIM per annum (no./annum)		
			Ocean-related services and infrastructure are adequate	Existing infrastructure/required infrastructure by type (ratio)	
				Funding provided to ocean-related services per annum (\$/annum)	
		Ocean-related human health, safety and security enhanced	Number of safety incidents reported by ocean-related industries (by sector and by type) per year (no./annum)		
			Number of marine security incidents per year (no./annum)		
					Perceived security level
Economic					
Economic well-being	To contribute to wealth generation through activities related to the ocean system and distribution according to societal objectives	Generate wealth from the ocean by fostering new opportunities and supporting existing opportunities	Annual contribution of ocean sectors to provincial GDP (\$/annum; % GDP)		
			Real growth per sector per annum (%)		
			Genuine Progress Index		
			Number and value of new/emerging industries per annum (no.; \$/a)		
		Access to and distribution of wealth and benefits within coastal communities/Nova Scotia/Canada	Intrinsic value of protected species and MPAs		
			Provincial ocean sector tax revenues and royalties/ NS government budget (%)		
			State of satisfaction		
		Efficiency of resource use and ocean space	Multiplier value (in pilot communities or sectors)		
			Costs associated with management activities (\$/activity/annum)		
			Costs associated with regulatory activities as a percentage of revenue generated per sector (%)		
Industrial Capacity and Assets	To support commercial activity and non-commercial uses within the bounds of resource capacity, while incorporating a culture of resource stewardship	Industrial infrastructure capacity is balanced with resource availability	Fishing fleet capacity/TAC or quota (ratio)		
			Percentage licensed fishing capacity working (%)		
			Cumulative production vs reserves (oil and gas; aggregates) (units/annum)		
			Percentage utilization of communication infrastructure		
		Multi-sectoral use is balanced and resource use conflict decreased on the Scotian Shelf	Sectoral footprints (area)		
			Number and type of conflicts or incidents (no.; quantitative description)		
		Stewardship and best practices are promoted	Number of best practice guidelines developed		
			Amount of effluent discharged directly into the marine environment per annum by type		
					No. of birds oiled at sea per annum

Table 4.2 ESSIM Objectives, Sub-Objectives and Indicators			
Overarching Objective: To contribute to social, cultural and economic well-being by achieving ecologically sustainable and integrated use of the ocean space and resources in the ESSIM area			
Human Use Element	ESSIM Objective	Sub-Objective	Outcome Indicators
Institutional Integrated Management Process	To develop institutional arrangements and capacity, and appropriate management strategies and actions that contribute to integrated ocean management	Collaborative planning structures with adequate capacity, which are accessible to community members	Audited budgetary expenditure for operating formal ESSIM management structures (\$/annum)
			Budget allocations made by ESSIM stakeholders in order to participate in ESSIM management structures (\$/annum)
			Number of personnel hours allocated by collaborating parties for ESSIM activities (hours/annum)
			Extent of participation in formal ESSIM activities
			Presence of a stakeholder register and database which also outlines ESSIM responsibilities and involvement
			Number of key decisions that are made by ESSIM structures (no.)
		Policies, plans, programs and measures applicable to ocean users	Presence of the ESSIM Plan
			Policies and programs relevant to ESSIM
			Presence of operational guidelines and practices for each of the user sectors
			A checklist of required documents that apply to ESSIM management
		Legal principles (international, federal and provincial) and responsibilities implemented	A published review of applicable legislation for ESSIM area
			Number of newly introduced legislative directives per annum that apply to ESSIM users (no.)
			Number of newly introduced legislative directives per annum that apply to ESSIM regulators (no.)
			Resources and activities that arise as a result of newly introduced directives
		Ocean user compliance with the ESSIM Plan and regulator accountability toward the Plan	Number of officially reported incidences of non-compliance per annum (no.)
			Number of successful prosecutions per annum (no.)
			Number of "unofficial" incidences of non-compliance per annum (no.)
			Presence of a monitoring and reporting system
		An effective communication system by which the public and stakeholders are made aware of, and are able to understand, ESSIM in terms of decisions, activities and implications	Presence of a Communication Strategy and Program
			Numbers of stakeholders who receive and read an ESSIM general newsletter (no.)
			Number of official radio and TV, website announcements related to ESSIM activities (no.)
			Number of regular formal reviews undertaken to assess ESSIM (no./annum)
		Adaptive management in response to change	Number of changes to the plan that are made in response to formal review of ESSIM (no./annum)
			Number of changes to the plan that are introduced in response to unforeseen circumstances (no./annum)
			Number and budget of research projects in the ESSIM area by subject (no. and \$/annum)

5.0 RECOMMENDATIONS AND CONCLUSIONS

The process to develop the Human Use Objectives Framework and the objectives and indicators incorporated in it, has been a lengthy one, requiring input from many stakeholders and interested parties. It has been a joint effort by all sectors to develop objectives that are specific, measurable, achievable and realistic. This draft of the objectives and indicators is proposed as the framework that will be incorporated into the ESSIM Plan. There are several areas that require attention with regard to implementation of the objectives and their further development. These are discussed below and recommendations made.

5.1 Implementation of the Objectives

The objectives that have been developed form the basis of the ESSIM Plan with regard to the human system. Their implementation is going to be challenging. DFO has already taken several steps toward implementation by setting up the structures and networks that are required for integrated management (see the Collaborative Planning Model, www.dfo-mpo.gc.ca/oceans/e/essim/essim-reports-e.html).

However, the ESSIM Initiative, although facilitated by the DFO, should not be viewed as a DFO process, it belongs to all stakeholders. ESSIM is about collaboration, and that every member has an equal voice in the process and, with that, equal responsibility. If ESSIM fails, it is the failure of *all* ESSIM stakeholders, including fishers, communities, industries, researchers and regulatory agencies (e.g., Transport Canada, Environment Canada, Natural Resources Canada, Industry Canada, the Government of Nova Scotia and DFO).

Thus, implementation of the objectives requires commitment by stakeholders and regulators, not just DFO as the lead agency. This needs to be communicated clearly to all interested parties. At present there is still the view that ESSIM is a DFO process, and there is some resistance stemming from historical perceptions of DFO's role. There also needs to be buy-in from regulators, not just as participants, but as partners.

5.2 Integrating the Human Use Objectives Framework with the Ecosystem Objectives Framework for the ESSIM Plan

The Ecosystem Objectives Framework is currently being developed to be included in the ESSIM Plan as complementary to the Human Use Objectives Framework. Although they have been developed separately, there is a need for their integration within the Plan.

To understand how this may be achieved, it is necessary to look at the similarities and differences between the two frameworks. Both frameworks take a hierarchical approach with regard to development of objectives, with the main differences being the terminology used. The different terms are presented in Table 5.1. Where possible, terminology should be consistent between the two

frameworks. This can probably be achieved for all the terms below, with the exception of "human use element" and "ecosystem element", which make sense to keep as they are.

Table 5.1 Concurrent Terminology Used for Each Framework	
Human Use Objectives Framework	Ecosystem Objectives Framework
Overarching objective (not yet accepted nationally)	National objective (have been accepted nationally)
Human use element	Ecosystem element
ESSIM objective	Conservation objective
Sub-objective	Operational objective
Outcome indicator	Indicator

The approaches to developing the objectives and indicators have been similar in that they have identified and placed a value on human and ecosystem elements that are important. However, the ecosystem approach has been to work from species/habitat level and decide what is required to maintain the health of these elements on an ongoing basis, and what issues or pressures need to be addressed. The human use approach has been to identify a final required state and identify the changes needed to reach this state. The common point in the two frameworks is that human use of the resources places pressures on the ecosystem. Decision-making with regard to human use of resources will require an understanding of these interactions, to which some basic tenets apply:

- Harvesting of living resources must be within the carrying capacity of the harvested resources, as well as other ecosystem elements that may be unintentionally impacted;
- Extraction of non-renewable resources must be undertaken in an environmentally sound manner so that ecosystem structure and functions are not significantly altered and the ecological footprint is minimized;
- Use of non-living, renewable resources should be sustainable over time and any environmental footprint should be minimized; and
- Any contaminant input into the environment must be within the assimilative capacity of the ocean so as not to affect the long-term ecological sustainability of the ecosystem.

Integration of the two frameworks relies primarily on being able to identify the levels of human use that should be allowed, based on ecosystem thresholds.

There are several integrated cross-cutting issues that pertain to both ecosystem objectives and human use objectives. It is recommended that, at this stage, integration of the two frameworks concentrates on these cross-cutting issues. These include:

- **Research and monitoring**, as outlined in *IMP6: Adaptive management in response to change* (see Appendix C). Obviously research and monitoring pertain to both ecosystems and human resource use. Research needs for ecosystems will need to be identified from ecosystem indicators, but undertaking the research falls under the human use objectives as a management action.

- **Economic value of natural resources** - Natural resources have an extracted value, but they also have an intrinsic value if left *in situ*. The human use objectives related to economic well-being recognise the intrinsic value of resources as part of the *economic system*. The *ecosystem framework* could help identify those species and habitat which have greater value in maintaining the ecosystem integrity of the ESSIM area.
- **Industrial capacity and resource availability**, as described in ICA1: *Industrial infrastructure capacity is balanced with resource availability*. This is particularly pertinent to the harvesting of living resources, i.e., the fishing industry. Resource availability can readily be determined through current understanding of fish stocks and resources, which fall under the Ecosystem Objectives Framework.
- **Resource stewardship**, as described in ICA3: *Stewardship and best practices are promoted*. The ecosystem framework should be able to provide some indication of actions required to conserve species and habitats. These can then be communicated to users of the resources and incorporated into best practices.

Once the Ecosystem Objectives Framework has been drafted, a professional person from the ESSIM secretariat will need to assess common links and gaps where further development of the two frameworks is required.

5.3 Use of the Indicators

5.3.1 Interpretation of Indicators

The main goal of establishing indicators for ESSIM is to measure, monitor and report on progress towards meeting the objectives. Within this, indicators have numerous uses and potential for improving ocean management, including:

- Monitoring and assessing conditions and trends;
- Comparing situations;
- Assessing the effectiveness of policy-making;
- Monitoring changes in public attitude and behaviour;
- Ensuring understanding, participation and transparency in information transfer between interested and affected parties;
- Forecasting and projecting trends, and
- Providing early warning information.

However, there are pitfalls to the use of indicators, including (Meadows 1998):

- Over-aggregation – if too many parameters are joined together, the message presented by the indicator may become indecipherable;

- Measuring what is measurable or for which there is information, rather than what is important;
- Dependence on a false model or misunderstanding the true meaning of an indicator;
- Deliberate falsification if an indicator carries bad news;
- Diverting attention from direct experience, and increasing the reliance on data rather than knowledge;
- Overconfidence, particularly in indicators where interpretation is important, and
- Incompleteness – indicators are not the real system, and they may miss some of the subtleties, possibilities and warnings of the real system.

Thus, the interpretation and use of indicators is important to their success. Often indicators used singly present a different picture to when they are used in conjunction with other indicators. It is recommended that the ESSIM reporting, using the indicators developed, is done by a technically competent person (or team), who understands the indicators, as well as the issues represented.

5.3.2 Data Access and Management

One of the main concerns with respect to indicator systems is that they are often data rich, and require input from a variety of resources. Unless full co-operation of source organisations is attained and a data management system is put in place, data may be a limiting factor to the success of the reporting framework for ESSIM.

At this stage it is uncertain as to which indicators have data that are readily available. It is recommended that a pilot study be undertaken to test the indicators for practical application and data availability. The most appropriate method is to prepare a baseline study as a state of the environment report for the ESSIM area, based on the recommended indicators. This will have several advantages:

- It can be used to determine data availability for each indicator, or provide an estimation of resources that are required to collect data that are currently unavailable;
- It will provide a good practical evaluation of the usefulness of the indicators, and how they are best interpreted; and
- It will provide a baseline against which future conditions can be compared.

5.3.3 Identification of Core Indicators.

At the moment there are 63 recommended indicators for the human use framework alone. To be able to report on these regularly, it may be necessary to identify core indicators that provide a "snapshot" of the current situation. This will provide a red-flagging system for potential concerns, without placing an unnecessary burden on the reporting system. Obviously the final list of core indicators will also depend on data availability.

Recommended core indicators are listed in Table 5.2. However, it is recommended that core indicators be chosen after the indicators have been tested.

Table 5.2 Recommended Core Indicators		
Human Use Element	ESSIM Objective	Outcome Indicators
Community well-being	To contribute to the long-term social and cultural well-being of communities in Nova Scotia	Provincial employment levels per sector (no. of people)
		Age structure of community in pilot communities (years)
		Income from economic activities (\$/activity)
		Number of certificates issued through approved training courses (no./annum)
		Existing infrastructure/required infrastructure by type (ratio)
Economic well-being	To contribute to wealth generation through activities related to the ocean system and distribution according to societal objectives	Perceived security level
		Annual contribution of ocean sectors to provincial GDP (\$/annum; % GDP)
		Genuine Progress Index
		Intrinsic value of protected species and MPAs
		State of satisfaction
Industrial Capacity and Assets	To support commercial activity and non-commercial uses within the bounds of resource capacity, while incorporating a culture of resource stewardship	Fishing fleet capacity/TAC or quota (ratio)
		Cumulative production vs reserves (oil and gas; aggregates) (units/annum)
		Sectoral footprints (area)
Integrated Management Process	To develop institutional arrangements and capacities, and appropriate management strategies and actions that contribute to integrated ocean management	Audited budgetary expenditure for operating formal ESSIM management structures (\$/annum)
		Number of personnel hours allocated by collaborating parties for ESSIM activities (hours/annum)
		Presence of a stakeholder register and database which also outlines ESSIM responsibilities and involvement
		A checklist of required documents that apply to ESSIM management
		Number of officially reported incidences of non-compliance per annum (no.)
		Numbers of stakeholders who receive and read an ESSIM general newsletter.
		Number of official radio and TV, website announcements related to ESSIM activities (no.)
		Number and budget of research projects in the ESSIM area by subject (no. and \$/annum)

5.4 Conclusion

This document provides the first full draft of the Human Use Objectives Framework. In the near future, it is envisaged that the framework will be reviewed by stakeholders and revisions made that are incorporated into the ESSIM Plan. However, as ESSIM is implemented and circumstances change, or new information becomes available, the objectives may require revision, along with the indicators.

There are three main areas that require immediate attention, (*i.e.*, within a timeframe of about one year):

- Getting stakeholders and regulators to take responsibility for implementation of the objectives;
- Integrating the Human Use Objectives Framework and the Ecosystem Objectives Framework in a practical way; and
- Testing the indicators developed as part of this project through a pilot study as briefly outlined in section 5.3.2 above.

6.0 REFERENCES

Anielski, M. 2001. The Alberta GPI Blueprint, The Genuine Progress Indicator (GPI) Sustainable Well-Being Accounting System. Pembina Institute, Drayton Valley, AL. 116 pp.

Anielski, M., M. Winfield and Pembina Institute. 2002. A Conceptual Framework for Monitoring Municipal and Community Sustainability in Canada. Prepared for Environment Canada. Pembina Institute, Ottawa. 130 pp.

Barbière, J. (Ed). 2003. A Reference Guide on the Use of Indicators for Integrated Coastal Management. ICAM Dossier I, IOC Manuals and Guides No. 45. 126 pp.

Charles A, Boyd H, Lavers A and Benjamin C. 2002. The Nova Scotia GPI Fisheries and Marine Environment Accounts: A Preliminary Set of Ecological Indicators of Ecological, Socioeconomic and Institutional Indicators for Nova Scotia's Fisheries and Marine Environment. GPI Atlantic, Halifax.

Fisheries and Oceans Canada (DFO). 2002. Canada's Ocean Strategy. DFO, Ottawa. 36 pp.

Fisheries and Oceans Canada (DFO). 2003. A Strategic Planning Framework for the Eastern Scotian Shelf Ocean Management Plan: A Discussion Paper Prepared for the ESSIM Forum. DFO, Dartmouth. 37 pp.

Fisheries and Oceans Canada (DFO) and Department of Fisheries and Aquaculture, Government of Newfoundland and Labrador (DFA). 2004. Federal-Provincial-Territorial Coastal and Ocean Indicators in Support of the Integrated Management of the Oceans. DFO, Ottawa. 39 pp.

Fraser Basin Council. 2001. Sustainability Indicators for the Fraser Basin: Consultation Report. Fraser Basin Council, Vancouver BC. 44 pp.

Kunte, A., K. Hamilton, J. Dixon and M. Clemens. 1998. Estimating National Wealth: Methodology and Results. Environment Department Papers No. 57. Environmental Economics Series, World Bank, Washington DC.

Meadows, D.H. 1998. Indicators and Information Systems for Sustainable Development. A Report to the Balaton Group. September 1998. The Sustainability Institute, Hartland Four Corners, VT. 78pp.

Meter, K. 2004. Fifty-Year Vision and Indicators for a Sustainable Minneapolis. Minneapolis Sustainability Roundtable, Minneapolis MN. 51 pp.

Organisation for Economic Co-operation and Development (OECD). 1993. Environmental Indicators: Basic Concepts and Terminology. Background paper No. 1. OECD, Paris. 150 pp.

Pomeroy R.S, J.E. Parks and L.M. Watson. 2003. How is Your MPA Doing? A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Areas Management Effectiveness. IUCN, Gland, Switzerland and Cambridge, UK. xv + 230 pp.

Stahl, M. and R. Farrell. 2004. Performance Measurement Guidance for Compliance and Enforcement Practitioners. Draft 2. US EPA. 30 pp.

Walmsley, J. 2004. Developing Objectives and Indicators for Marine Ecosystem-Based Management: International Review – Ecosystem-Based Management Initiatives Throughout the World. DFO, ESSIM Forum, Dartmouth. 55 pp. + appendices.

Wilkinson, K.P. 1991. The Community in Rural America. Greenwood Press, Westport, CT. 141 p.

APPENDIX A

**SUMMARY OF THE ESSIM HUMAN USE
OBJECTIVES SUB-WORKING GROUP**

SUMMARY OF THE ESSIM HUMAN USE OBJECTIVES SUB-WORKING GROUP

Group Members:

Kim Doane (NS Energy), Murray Rudd (DFO), Jay Walmsley (Jacques Whitford), Rosanne LeBlanc (DFO), Richard Apostle (Dalhousie University), Cathy Merriman (WWF), Sandra Farwell Scarfone (SPANS), Heather Breeze (DFO), Scott Coffen-Smout (DFO), Eric Theriault, (CNSOPB).

The Group's Task:

The Human Use Objectives Sub-Working Group is a sub-group of a multi-stakeholder sub-regional planning group that formed in the spring of 2003 to develop a prototype integrated management plan for a selected ecosystem sub-unit in the Eastern Scotian Shelf planning area (i.e., Sable-Banquereau and the Slope waters). A second sub-group of the larger working group produced an ecosystem objectives and indicators framework that has formed the basis of work by the DFO ESSIM Science Working Group.

The Human Use Objectives Working Group was tasked to develop socio-economic, cultural and institutional (governance) objectives and indicators as monitoring and performance measures for the ESSIM Plan. A working paper for the Sable-Banquereau and Northeast Slope OMA Planning Exercise was prepared by DFO/OCMD in June 2003 titled "Developing an Operational Framework for Socio-Cultural, Economic, Institutional and Sustainable Use Objectives." The working paper and the *Strategic Planning Framework for the Eastern Scotian Shelf Ocean Management Plan: A Discussion Paper* (Jan 2003) formed the basis of background materials and elaborated the high-level ESSIM management objectives. Other related background material is listed in the Annex.

The working group employed a collaborative process to test and demonstrate the practical application of integrated management for the selected area (i.e., Sable-Banquereau and the Slope waters). This planning exercise was to provide guidance for the future development of the integrated management plan and related ESSIM planning activities. The results of the planning exercise will be reported to the broader ESSIM network at the 3rd ESSIM Forum Workshop in February 2005. The working group was to complete the planning cycle for a selected area and provide a practical illustration of the integrated management and planning process. The outcomes of the planning exercise were expected to provide guidance and help influence the current and future management of the area. The members of the working group volunteered their time and expertise, with the participants noted as above.

Activities:

The working group began by "unpacking" the high-level management objectives (socio-economic, cultural, institutional/governance) outlined in the *ESSIM Strategic Planning Framework* (the discussion paper referred to "sustainable use objectives"). The Working Group's direction was influenced by information presented regarding the Treasury Board of Canada Secretariat's audit and performance measures and Murray Rudd's work on monitoring system sustainability and management performance, with the latter describing the basic elements of a monitoring framework for integrated management. This included a set of capital assets (e.g., natural, social, human, industrial) and various institutions (i.e., rules in use), and the complex capital flows and linkages among them. The group identified and articulated more specific objectives and indicators in support of the broader ESSIM management objectives in four categories labelled "human use elements" as follows:

- Community Well-being,
- Wealth Generation,
- Industrial Capacity and Assets (by 4 industry sectors), and
- Integrated Management Process.

The group also identified human use elements for "State Capacity" and "Community Capacity" that were subsequently considered to overlap with the other four elements. Draft fact sheets for each of the human use elements were prepared by group members, including the following information:

1. Statement of objective;
2. Definition of objective purpose and scope (relevance to ESSIM context, challenges involved, key references (e.g., national/international);
3. Potential indicators (quantitative/qualitative measures and targets, key references, e.g., national/international); and
4. Linkages to other ESSIM objectives/indicators.

To develop the fact sheets the group drew on existing indicators published in the literature.

The group felt that the human use elements adequately linked back to the *ESSIM Strategic Planning Framework* and that the group made progress, although progress was slow in the unpacking exercise and the development of an operational monitoring framework for the prototype plan. It is important to note that the work undertaken on human use objectives and indicators was largely aimed at the broader Shelf-wide scale (rather than the sub-region), given the regional nature of the exercise and the scale at which such data is collected.

It is important to emphasize that the Working Group had no national monitoring framework, guidelines, or reference from which to base the development of a regional human use objectives

and indicators framework. The Working Group drew upon various approaches and methodologies to develop an operational framework from high-level, conceptual management objectives to more operational objectives, sub-objectives, indicators, reference points, and targets to management actions and options. The group only advanced work on the objectives, sub-objectives and potential indicators (see Table 1). Further work on, for example, reference points, targets, management strategies and actions is still to be done.

Table 1: Proposed Human Use Objective Framework

Overarching Objective: To provide opportunities for economic diversification and sustainable wealth generation to foster social well-being for coastal communities and stakeholders.			
Human Use Element	ESSIM Objective	ESSIM 2nd level Objective	Indicators
Community well-being	Ensure that the well-being of Nova Scotian communities is maintained or increased now and in the future	Ensure that access by Nova Scotians to livelihood opportunities is maintained now and in the future	Provincial GDP per capita Real growth per sector per annum (oil & gas; fishing; transport; communications; marine services) Employment per sector as a percentage of total Unemployment (per sector) Productivity per person employed per sector. Average personal income (per sector) New motor vehicle sales Migration out of communities/Nova Scotia
		Ensure that Nova Scotian communities participate actively in governance and decision-making with regard to ESSIM	State of satisfaction (based on designed survey) Percentage of stakeholder group in leadership positions. See section on integrated management
		Ensure that Nova Scotian communities are resilient to change created by a diversity of activities and peoples	Debt levels among fishers/ First Nations/ Reported bankruptcies Bankruptcy liabilities Age distribution amongst fishers/other communities Diversification of employment sources Household income distribution by source Household occupational structure Average weekly employment insurance benefits Retirement savings through RRSPs and RPPs
		Ensure that education and skills levels of communities are maintained or improved	Secondary school graduates per annum University qualifications granted to Nova Scotians Population by highest degree, certificate or diploma Library card holders % Literacy in persons >15 years
		Ensure that basic services and infrastructure are adequate	Number of telephone lines per 1000 inhabitants Number of broadband subscribers Percentage of households serviced (sewerage & water) Population by type of dwelling
Wealth Generation	To generate wealth from the ocean system, to retain wealth generated by this system, and to distribute wealth according to social objectives	Generate wealth from the ocean system in the Sable-Banquereau area by using resources efficiently	See measures for fisheries, oil and gas, and shipping
		Generate wealth from the ocean system in the Sable-Banquereau area by minimizing management (transaction) costs to industry and government	See measures for fisheries oil and gas, and shipping
		Generate wealth from the ocean system in the Sable-Banquereau area by accounting for non-market (e.g., ecological or lifestyle) services/benefits.	?
		To retain wealth generated for the ocean system.	See measures for fisheries, oil and gas, and shipping
		To distribute wealth according to social objectives.	See community profile data from StatsCan

Overarching Objective: To provide opportunities for economic diversification and sustainable wealth generation to foster social well-being for coastal communities and stakeholders.			
Human Use Element	ESSIM Objective	ESSIM 2nd level Objective	Indicators
Industrial Capacity and Assets (Oil and Gas)	To balance economics and wealth generation, while incorporating resource stewardship and continuing to ensure that the environment is protected, leading to the future well being of Nova Scotian communities.	To ensure that any policies, plans and measures developed contribute to sustainable development and provide long-term economic benefits.	Production volumes (daily, monthly, yearly) Levels of capital, labour force, equipment, other supply services Number of Environmental Assessments and Strategic EAs for environmental protection Number of wells drilled (location, water depth, days on location, time of year) Number of Seismic programs (type, area, duration, research components) Economics: (a) Royalties paid directly to the Province of Nova Scotia and (b) Spin-off industries (OTANS)
Industrial Capacity and Assets (Shipping)	To promote an economic and competitive marine transportation industry as one component of a competitive Canadian transportation system.	To foster growth of a Canadian flag merchant fleet.	Tonnages loaded/unloaded by port TEUs handled by port Vessel transits/ movements on the Scotian Shelf Canadians employed by fleet Percent of international fleet of Canadian owned/registered vessels Vessel capacity measures
		To promote and protect shipping interests by working with governments and international marine organizations to develop policies, laws and regulations that enable the industry to flourish as a key contributor to the Canadian economy.	Shipping industry participation on national and regional Canadian Marine Advisory Councils Participation on other economic development advisory bodies and associations etc.
		To promote safe navigation and a cleaner shipping environment.	Port State Control inspections/year Vessel source discharges detected/year Vessel accidents or discharges /year Birds oiled at sea
Industrial Capacity and Assets (Fisheries)	To balance industrial and infrastructure capacity with resource availability. Resources need to be maintained and at the same time, ensure that the long-term economic viability of industry is maintained.		Number of vessels active by homeport; Number of fishers; License values; Landed value by statistical district/port in the ESSIM area; Employment (harvesting and processing sectors); Fisheries sector contribution to GDP Revenues Exports (or US Import data) Natural capital Resource depreciation Income distribution Community/ employment diversification index; Investment trends
Industrial Capacity and Assets (Government Activity)	To maintain government capacity and platforms to fulfill mandate/ regulatory responsibility for: marine scientific research; search and rescue; maritime surveillance, monitoring and control for environmental protection and ship safety; and maritime security and defence.		Vessel capacity measures by area or region Vessel capacity measures by regulatory responsibility

Overarching Objective: To provide opportunities for economic diversification and sustainable wealth generation to foster social well-being for coastal communities and stakeholders.			
Human Use Element	ESSIM Objective	ESSIM 2nd level Objective	Indicators
Integrated Management Process	Ensure that the IM planning process is collaborative, inclusive and transparent, and based on effective networks, communication and understanding among all interested and affected parties.	Establish sufficient networks and communications to attract and maintain the participation of a fully representative selection of stakeholders.	All relevant sectors participate in process. Variety of stakeholders in leadership positions within ESSIM planning bodies.
		Resource user capacity effectively built to participate in process and management	Paid positions in fishing organizations can dedicate time to IM participation.
		Community participation strengthened and enhanced	High proportion of affected communities participating and contributing to ESSIM.
		Develop effective mechanisms to deal with, and move beyond, user conflicts	Decreased number of recorded conflicts.
	Ensure that ocean management plans are based on shared information where those with decision-making authority and those affected by the decisions jointly seek outcomes that meet the needs of all parties to the greatest possible degree.	Develop information-exchange structures that stakeholders are willing to participate in.	Measure numbers related to information outlets e.g. newsletter. All relevant stakeholders satisfied about level and nature of information they are receiving.
		Resource user capacity effectively built to participate in process and management	Paid positions in fishing organizations can dedicate time to IM participation.
	Ensure that the integrated ocean management and planning process is adaptive and responsive to the changing environmental, social, cultural, economic and institutional conditions	Design mechanisms to monitor, and adapt to, changing environmental, social, cultural, economic and institutional conditions	Results feeding regularly back into management process.
		Develop clearly defined rules for resource use and for resource and habitat conservation	Best practices implemented in ESSIM area for all uses. Common ground between conservation objectives and resource use objectives identified, used to guide creation of rules.
	Ensure that those with the authority, power and responsibility to implement agreed-upon management plans and measures do so as part of their commitment and accountability to the process	Develop governance structures that take into account stakeholder input in a meaningful way.	Stakeholders satisfied with decisions.
		Human and financial resources sufficient, and used effectively and efficiently	Audits
		Compliance with management plan ensured	% compliance
	Ensure that the integrated ocean management and planning process builds on and enhances existing management structure and systems, and is capable of addressing international, national, regional and local requirements and responsibilities	Identify overlaps between relevant existing structures and those necessary for ocean management and planning process	All government operations running at full efficiency.
		Analyze local, regional, national and international contexts to identify requirements and responsibilities relevant to IM process	
		National and/or local legislation effectively incorporates rights and obligations set out in international agreements and legal instruments	Internal indicators on government performance

In the absence of national socio-economic and institutional objectives, the group agreed to a proposed high-level, overarching management objective—*To provide opportunities for economic diversification and sustainable wealth generation to foster social well-being for coastal communities and stakeholders.*

The Working Group recognized the complexity and future challenge of linking the human use objectives and indicators framework with the complementary ecosystem objectives and indicators framework currently being advanced by the DFO ESSIM Science Working Group. The two frameworks interweave at multiple levels. Apart from admitting that it will be very complex to ensure that both frameworks are properly aligned and cross-referenced, the Working Group is unsure as to how the two frameworks will link operationally.

The Working Group sought additional sources of information and experience in sustainable development, ocean and coastal management, or comparable areas of work, such as watershed planning and forestry management. During discussions, the participants noted the importance of clear definitions and terminology (e.g., the definition of "community well-being").

Lessons Learned:

The larger Working Group was not able to accomplish its original goal, namely to develop a plan for a sub-regional area of the ESSIM region. One of the recommendations of the Human Use Objectives Sub-Working Group to advance this work was to convene a Human Use Objectives workshop prior to the 3rd ESSIM Forum Workshop. Limiting the plan to a pilot area did not limit the issues that needed to be considered as they related to human use elements. When devising the objectives and identifying potential indicators, many were more applicable at the shelf-wide scale than at the sub-regional scale. The Working Group made progress in developing an overall monitoring framework and approach to the entire ESSIM area, and not just to the Sable-Banquereau-Slope sub-regional planning area.

The experience with the Working Group has been a microcosm of the broader multi-stakeholder planning process. Some of the key lessons learned include the following:

- Because the work of the group was very much an exploratory exercise, carefully worded terms of reference and a tight work-plan did not necessarily help the group advance.
- Progress was slow and iterative.
- Paper outputs are not the ultimate measure of success; the process of engagement and cooperation is a very important outcome.
- Forming the "right team" in terms of skills and personalities is important; often human perspectives and biases are key determinants of the Working Group's product.
- Although efforts were made to broaden group membership, participation on the working group was not as broad and diverse as it should have been. The group would have benefited from greater expertise in indicator development.
- Working at the right level of detail for the task at hand and to the strengths of the Working Group is important. When dealing with complex tasks, avoid minute details and maintain the bigger picture of what needs to be done.

ANNEX

Several documents were identified as being of relevance to the Working Group and the ESSIM process.

"Environmental Signals: Canada's National Environmental Indicator Series 2003" (Environment Canada, 2003) [Also accompanying document entitled "Environmental Signals: Headline Indicators 2003"] Online: <http://www.ec.gc.ca/soer-ree/>

"A Reference Guide on the Use of Indicators for Integrated Coastal Management" (Intergovernmental Oceanographic Commission of UNESCO, Manuals and Guides 45, 2003). Online: <http://ioc.unesco.org/icam/files/Dossier.pdf>

"Sustainability Reporting Guidelines" (Global Reporting Initiative, 2002) Online: www.globalreporting.org

"The Nova Scotia GPI Fisheries and Marine Environment Accounts: A Preliminary Set of Ecological, Socioeconomic and Institutional Indicators for Nova Scotia's Fisheries and Marine Environment" (GPI Atlantic and Tony Charles, January 2002). Online: www.gpiatlantic.org

M.A. Rudd, "An institutional framework for designing and monitoring ecosystem-based fisheries management policy experiments," *Ecological Economics* 48 (1), January 2004, 109-124.
<http://www.sciencedirect.com/science/article/B6VDY-4B4XTG5-3/2/59f1e40f614d0beb397ce27403217925>

APPENDIX B

**RESULTS OF STAKEHOLDER WORKSHOP
1-2 DECEMBER 2004**



Fisheries and Oceans
Canada

Pêches et Océans
Canada

ESSIM Human Use Objectives Workshop

Workshop Report

December 20, 2004

Canada

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Introduction

Under the 1997 *Oceans Act*, Fisheries and Oceans Canada (DFO) is leading and facilitating the development of integrated management plans for Canada's oceans. Integrated management is a multi-stakeholder process aimed at addressing the multiple and potential competing uses in the oceans, and will consider impacts from these activities at an ecosystem level.

One of the integrated management projects is the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative. Through ESSIM, DFO is working with a range of stakeholders to develop and implement an integrated ocean management plan on the Scotian Shelf (ESSIM Plan). As part of the ESSIM Initiative, the DFO has undertaken a program to develop a set of objectives and related indicators for ecosystem-based management. This includes the development of a framework, objectives and indicators that relate to the ecosystem or ecological aspects of the system, as well as the development of the same for human use of the resource. The human-use aspects include social, economic and institutional components of ecosystem-based management.

In order to achieve their objectives, in 2003 DFO established a multi-stakeholder working group to develop a framework for human use objectives and indicators. The working group made significant progress in selecting human-use elements and identifying broad scale objectives and potential indicators.

In order to further the work on developing the framework and objectives a workshop multistakeholder workshop was held on December 1-2, 2004 at the Bedford Institute of Oceanography. This report outlines the main issues identified at the workshop and workshop outcomes.

Aims of the Workshop

The objectives of the workshop were to:

- Assess the proposed framework as a logical model to organize objectives and indicators;
- Assess proposed objectives using evaluation criteria based on requirements for the integrated management of the Eastern Scotian Shelf;
- Identify a set of key indicators for the social, economic and institutional components of the framework, where possible at a sectoral level.

The workshop agenda is provided in Annex 1.

Session 1: Introduction & Human Use Objectives Framework

Introduction

Participants to the workshop were welcomed by Mr. Joe Arbour, Head of Ocean and Coastal Management Division, DFO. A list of participants is provided in Annex 2.

To provide background to ESSIM and the framework that was developed for human use objectives and indicators, two presentations were made by the project team:

- **Context for the Development of Human Use Objectives**, Tim Hall, Oceans and Coastal Management Division, DFO; and
- **Proposed Human Use Objectives and Indicators Framework**, Scott Coffen-Smout, Oceans and Coastal Management Division, DFO/Dr Jay Walmsley, Jacques Whitford.

Hard copies of the presentations are provided in Annex 3 of this report.

Framework

In general, the workshop participants were satisfied with the proposed hierarchical framework for the development of objectives and indicators.

Overarching Objective

The overarching objective that had been developed by the working group, and presented to the participants at the workshop, was originally expressed as:

To provide opportunities for economic diversification and sustainable wealth generation, to foster social well-being for coastal communities and stakeholders.

There was concern with some of the terminology used in expressing the overarching objective, particularly with regard to:

- **Diversification** – the meaning was not fully understood by many of the participants. Although it was agreed that communities should not be reliant on only one industry or market, concern was expressed that the term had broader connotations.
- **Wealth** – there was much debate regarding the implication of using the term *wealth*. On the one hand, concern was expressed that it implied "much for a few" rather than equity of distribution. On the other hand, some participants said that the term was well-defined in the literature, and incorporated not only financial wealth, but also natural wealth and intangible benefits. Costs and benefits were also implied in the term *wealth*, rather than the benefit side of the equation only.

- *Community* – the term *community* was not clearly understood, particularly with regard to the types of communities. It was pointed out that First Nations communities would have to be considered separately as they have different rights and mandates from other Nova Scotian communities, due to difference governance structures. Essentially, First nations would also have to be considered as another level of government as well as a community.

It was suggested that the overarching objective should encompass three aspects: (1) conservation and environmental responsibility; (2) ecological and economic sustainability; and (3) responsible use. Additionally, it should be viewed in the context of the ecosystem objectives, which have been developed at a national level in a process that was viewed as complementary to the development of human use objectives. The exact nature of the integration between human use and ecosystem objectives was not discussed in detail, but it was agreed that human use should not exceed the carrying capacity of the ocean system (as yet undefined).

It was agreed that those that benefit from the Scotian Shelf would mostly accrue to local communities within Nova Scotia, but that some of the benefits would be shared by people outside of the province. This was especially true for intangible benefits such as existence value.

In summary, it was agreed that:

- The overarching objective should be overtly conservation or natural resource oriented;
- The term *sustainable wealth generation* should be replaced by a statement such as *foster social, cultural and economic well-being*;
- *Economic diversification* did not capture the essence of economic well-being;
- The objective should not imply that the ESSIM Plan would deliver all aspects of social, cultural and economic well-being;
- Those influenced would include coastal communities and stakeholders, aboriginal communities and other non-coastal communities.

A revised overarching objective was accepted by the participants as follows:

To contribute to social, cultural and economic well-being by achieving ecologically sustainable and integrated use of the ocean space and resources in the ESSIM area.

Human Use Elements

On a discussion regarding the human use elements within the framework, it was generally agreed that the four proposed elements were adequate and would be expressed as:

- Community well-being;
- Wealth generation and distribution;
- Industrial capacity and assets; and
- Integrated management process.

The wording used would be re-evaluated during breakaway groups in session 2.

Session 2: Human Use Objectives for the Scotian Shelf

The aim of session 2 was to assess proposed objectives using evaluation criteria based on requirements for the integrated management of the Eastern Scotian Shelf. Participants were presented with the current framework (Table 1) and split into four breakaway groups to discuss the ESSIM objectives and sub-objectives for each of the four human use elements. The ESSIM objectives were to be evaluated in the light of the following questions:

- Will the objective lead to achieving the high-level objective?
- Does the objective meet the broad ESSIM goal and guiding principles?
- Is the objective compatible with the ecosystem objectives?
- Does the objective fall under the mandate of the *Oceans Act*?

Table 1. Proposed Human Use Elements and Objectives		
Overarching Objective: To provide opportunities for economic diversification and sustainable wealth generation to foster social well-being for coastal communities and stakeholders.		
Human Use Element	ESSIM Objective	ESSIM Sub- Objective
Social and Cultural		
Community well-being	Improve the well-being of Nova Scotian communities	Enhance access by Nova Scotians to sustainable livelihood opportunities derived from ocean resources
		Enhance Nova Scotian community participation in governance and decision-making with regard to ESSIM
		Enhance Nova Scotian communities' resilience to change through promoting a diversity of activities and peoples
		Enhance education and skills levels of communities
		Ensure that basic services and infrastructure are adequate
		Enhance health and safety of community members
Economic		
Wealth Generation and Retention	Generate wealth through activities related to the ocean system, retain wealth generated and distribute it according to social objectives	Generate wealth from the ocean system by using resources efficiently (stewardship)
		Generate wealth from the ocean system by minimizing management (transaction) costs to industry and government
		Generate wealth from the ocean system by accounting for non-market (e.g. ecological or lifestyle) services/benefits.
		Retain wealth generated for the ocean system.
		Distribute wealth according to social objectives.
Industrial Capacity and Assets	Ensure maximum industrial and commercial growth (oil & gas; fishing; shipping; tourism) within the bounds of resource capacity, and while incorporating a culture of resource stewardship.	Balance industrial and infrastructure capacity for the oil & gas sector with resource availability
		Balance industrial and infrastructure capacity for the fishing industry with resource availability
		Promote a competitive marine transportation industry, safe navigation and a cleaner shipping environment
		Promote a competitive, resource-friendly tourism industry
		Balance multi-sectoral use and decrease resource use conflict on the Scotian Shelf (oil & gas, fishing, shipping, cables & telecommunication, conservation, tourism)
		Decrease industrial pollution affecting the marine environment of the Scotian Shelf

Table 1. Proposed Human Use Elements and Objectives		
Overarching Objective: To provide opportunities for economic diversification and sustainable wealth generation to foster social well-being for coastal communities and stakeholders.		
Human Use Element	ESSIM Objective	ESSIM Sub- Objective
Integrated Management Process	Ensure that there are effective management/institutional structures, strategies and capacity to ensure adaptive integrated resource management	Institutional
		Ensure that sectoral policies, plans and measures contribute to sustainable resource use and provide long-term economic benefits.
		Ensure that co-management structures are appropriate and effective.
		Ensure that the integrated ocean management and planning process builds on and enhances existing management structure and systems (international, national, regional and local).
		Ensure ESSIM management plan compliance by resource users
		Ensure that the integrated management and planning process is adaptive and responsive to change.
	Promote effective stakeholder and community participation and representation	Ensure that the integrated management planning process is collaborative, inclusive and transparent, and based on effective communication among interested and affected parties. Ensure that ocean management plans are based joint decision-making between resource managers and resource users.

Much of the workshop was spent refining the objectives and sub-objectives, with considerable overlap between sessions 2 and 3. The objectives resulting from the workshop, as well as comments from the breakaway groups and plenary discussion are presented in Table 2.

Table 2: Workshop outcomes			
Overarching Objective: To contribute to social, cultural and economic well-being by achieving ecologically sustainable and integrated use of the ocean space and resources in the ESSIM area			
Human Use Element	ESSIM Objective	Sub-objective	Comments
Social and Cultural			
Community well-being	To contribute to the long-term social and cultural well-being of communities in Nova Scotia	Enhance access by coastal communities and all Nova Scotians to sustainable livelihood opportunities derived from ocean resources	Access relates to: • Legal access • Provision of opportunities • Rights and permission • Capacity (financial, organizational, numbers of people)
	or	Contribute to Nova Scotian communities' resilience by enabling participation in ocean uses, governance and decision making	Overall health of community as it relates to participation in a variety of activities Diversity of opportunities is considered important
	To contribute to vibrant, healthy, sustainable communities in Nova Scotia	Enhance ocean-related education, training and awareness	This includes: Education – being able to take part in governance Training – job preparedness (skills, safety etc)
		Contribute to adequacy of ocean-related services and infrastructure	This includes, for example: • Physical (wharves etc.) • Services (pump out, SAR)
		Enhance ocean-related human health, safety and security	This includes, for example: Health – marine environmental quality related training, education Safety – Search and rescue, boat inspections, codes of conduct, regulatory enforcement etc. Security – DND, RCMP etc.

Table 2: Workshop outcomes			
Overarching Objective: To contribute to social, cultural and economic well-being by achieving ecologically sustainable and integrated use of the ocean space and resources in the ESSIM area			
Human Use Element	ESSIM Objective	Sub-objective	Comments
Economic			
Wealth Generation and Distribution or Economic well-being	Wealth is generated through activities related to the ocean system and distributed according to societal objectives	Strive for access and distribution of wealth and benefits within coastal communities/Nova Scotia/Canada	Definitions are required for the terms: <i>access</i> and <i>distribution</i>
		Value is placed on natural capital	This could be incorporated rather as an underlying principle for wealth generation
		Fostering strong, diversified sustainable economy (new and current opportunities, including spin-off industries)	
		Efficiency of resource use and ocean space	This should be achieved through minimization of management and regulatory costs.
Industrial Capacity and Assets	Support commercial activity and other non commercial uses within the bounds of resource capacity, while incorporating a culture of resource stewardship	Balance industrial and infrastructure capacity with resource availability	This was considered most appropriate for, though not exclusive to, living resource
		Balance multi-sectoral use and decrease resource use conflict on the Scotian Shelf	This was considered most appropriate for, though not exclusive to, ocean space
		Promote stewardship and develop best practices	This was considered most appropriate for, though not exclusive to, non-living resources & others
Institutional			
Integrated Management Process	Develop institutional arrangements and capacities, and appropriate management strategies and actions that contribute to integrated ocean management	Establish collaborative planning structures with adequate capacity	This objective should incorporate accessibility to community members.
		Co-ordinate policies, plans, programs and measures applicable to ocean users to contribute to sustainable resource use	Are there policies, plans, measures at the federal, provincial and local levels being affected by and consistent with the ocean management plan?
		Implement international legal principles and responsibilities, assess and evaluate impact and effectiveness	Should address implementation of principles (e.g., precaution, ecosystem-based management, social and intergenerational equity, etc.) in legislation and in practice. Domestic part of this objective requires: • Identification of gaps re: non-sustainable use • Developing guidelines consistent with the principle of sustainable use (e.g., consistency with land use planning) • Measure degree of influence of change (e.g., new legislation) • Measure of participation in other sectoral processes • Consideration of planning at the local level and incorporation and implementation at the local level • Developing data sources (baseline data) • Conduct a survey of data sources
		Compliance with Plan by ocean users	Should include accountability by regulators.
		Ensure that IM planning process is timely, transparent and adequately addresses public awareness, expectations and communication	
		Adapt the IM and planning process in response to change (adaptive management)	Establish monitoring system to detect the need for changes to the plan.

Plenary Discussion

There was considerable debate regarding terminology. It was agreed that the fact sheets in the final report would include definitions for those terms that were considered ambiguous. These were identified during the working group sessions, and plenary debate contributed to an understanding of the various terms such as *wealth*, *communities*, *societal*, *economic diversification*, *social equity* etc.

The wording of the objectives should reflect that ESSIM does not have direct mandate over many of the aspects for which objectives were set, but will be able to have considerable influence through the collaborative management and planning framework (<http://www.mar.dfo-mpo.gc.ca/oceans/e/essim/essim-reports-e.html>). Thus words and phrases such as *foster, support, promote, contribute to, enhance* should be used rather than *ensure*.

It was agreed that objectives should be stated in a consistent manner. There was concern that the objectives were stated as a mixture of objectives and outcomes. Objectives should be specific, measurable, achievable and realistic.

The principle underlying all objectives was "ecological sustainability". This was expressed as part of the overarching objective and it was not considered necessary to repeat it in the ESSIM objectives and sub-objectives.

Although it was recognized that people outside of Nova Scotia might benefit indirectly from activities on or conservation of the Scotian Shelf, it was agreed that local communities should benefit first and foremost from ESSIM. It was also recognized that ESSIM was an offshore initiative that would influence coastal activities.

Session 3: Identification of Key Indicators

The aim of session 3 was to identify a set of key indicators for the social, economic and institutional components of the framework, where possible at a sectoral level. This objective was only partially met, with proposed indicators being provided for two of the human use elements as shown in Table 2. It was agreed that indicators would be developed by the consultant, based on the objectives resulting from the workshop and suggestions provided in Table 3.

Table 3: Proposed Indicators

Human Use Element	ESSIM Objective	Sub-objective	Indicators
Industrial Capacity and Assets	Support commercial activity and other non commercial uses within the bounds of resource capacity, while incorporating a culture of resource stewardship	Balance industrial and infrastructure capacity with resource availability	• Fleet capacity/TAC or quota • % licensed capacity working • Cumulative production vs reserves • % utilization of communication infrastructure
		Balance multi-sectoral use and decrease resource use conflict on the Scotian Shelf	• No. of conflicts/incidents • No. of habitat management plans
		Promote stewardship and develop best practices	• Sectoral footprints • Number of habitat management plan • Pollution indicators • % voluntary compliance

Table 3: Proposed Indicators

Human Use Element	ESSIM Objective	Sub-objective	Indicators
Integrated Management Process	Develop institutional arrangements and capacities, and appropriate management strategies and actions that contribute to integrated ocean management	Establish collaborative planning structures with adequate capacity and accessible to community members	• Is there a Plan, budget, staffing, business plan? • Examples of decision making from the structure • Number and nature of bodies/ committees • Comprehensiveness of intergovernmental / departmental engagement • Number of existing structures and systems that are consistent with the Plan
		Co-ordinate policies, plans, programs and measures applicable to ocean users to contribute to sustainable resource use	• Are there policies, plans, measures at the federal, provincial and local levels being affected by and consistent with the ocean management plan? • Develop a checklist to illustrate examples where it is being affected/ consistent • Number of times that the plan is considered/ignored • Number of policies, protocols, measures, and guidelines altered and created • Number develop /establish baseline data; data reporting system (where are the existing data sources?)
		Implement international legal principles and responsibilities, assess and evaluate impact and effectiveness	• To what extent is Canada implementing international agreements and treaties etc., via the ESSIM process?
		Compliance with Plan by ocean users and accountability by regulators	• Is there a compliance system? Data? website? Are there agreed core indicator sets? • Measure compliance with the objective • Undertake audits and evaluation of the plan • Number of conflicts / issues dealt with/ resolved by the planning process; • changes in conflict trends • % level of satisfaction of resource users with the IM process • Satisfactory management audit done with identification of non-compliance • Measure of mobilizing capacities and resources • Enforcements - changes in the # of violations/ infractions • Changes in CEAA EA process
		Ensure that IM planning process is timely, transparent and adequately addresses public awareness, expectations and communication	• Press releases, websites, reports • Number of new participants • Number of public meetings • Number of evaluations at annual ESSIM forum workshops
		Adapt the IM and planning process in response to change (adaptive management)	• Number of times the plan is revised

Session 4: The Way Ahead

It was agreed that a summary document would be sent to the participants as soon as possible, for their record and comment. A brief workshop report would be compiled by the end of December. Thereafter, a report outlining the Human Use Objectives Framework and indicators would be completed by mid-January 2005. This would be made publicly available on the ESSIM initiative website (<http://www.mar.dfo-mpo.gc.ca/oceans/e/essim>). Also, the 3rd ESSIM Forum was due to be held in February 2005. The draft ESSIM Plan would be presented to the stakeholders at the Forum in a workbook format.

Annex 1
Workshop Agenda

Agenda

**Human Use Objectives Workshop
December 1-2, 2004
Auditorium, Bedford Institute of Oceanography, Dartmouth**

Day 1- December 1, 2004

Session 1: Introduction & Human Use Objectives Framework

- 08h30 Registration
- 09h00 Welcome
- 09h15 Introductions and workshop objectives
- 09h30 *Context for the Development of Human Use Objectives*
Tim Hall, Oceans and Coastal Management Division, DFO
- 10h00 *Proposed Human Use Objectives and Indicators Framework*
Scott Coffen-Smout, Oceans and Coastal Management Division, DFO/
Dr Jay Walmsley, Jacques Whitford
- 10h30 Tea/Coffee**
- 11h00 Plenary discussion:
 • Proposed framework
 • Proposed high-level objective(s) and human use elements
- 12h30 Lunch**

Session 2: Human Use Objectives for the Scotian Shelf

- 13h15 Introduction to Session 2
- 13h30 Group session: Evaluation of proposed objectives
- 15h00 Tea/Coffee**
- 15h30 Group feedback and plenary discussion
- 16h30 End of Day 1**

Day 2 – December 2, 2004

Session 3: Identification of Key Indicators

- 08h30 Introduction to Session 3
- 08h45 Group session: Identify key indicators for each objective
- 10h30 Tea/Coffee**
- 11h00 Group session: Identify key indicators for each objective
- 12h30 Lunch**
- 13h30 Group feedback and plenary discussion

Session 4: The Way Forward

- 14h30 Workshop summary, unresolved issues and the way ahead
- 15h30 Closure**

Annex 2
List of Participants

Name of Participant	Organization	Contact Details
John Angel	Fisheries Resource Conservation Council Angel Consulting Services	19 Spray Avenue Head of St. Margaret's Bay Nova Scotia B3Z 1Z3 Tel: (902) 826-9224 jangel@hfx.eastlink.ca
Joe Arbour	Division Manager, Fisheries & Ocean Canada, Oceans and Coastal Management Division	Bedford Institute of Oceanography PO Box 1006 Dartmouth, NS B2Y 4A2 Tel: (902) 426-3894 Fax: (902) 426-3855 arbourj@mar.dfo-mpo.gc.ca
Cheryl Berube	Eskasoni Fish and Wildlife Commission	4123 Shore Road PO Box 8097 Eskasoni, NS B1W 1C2 Tel: (902) 379-2024 x 227 cheryl@efwc.ca
Heather Boyd	PhD Fellow	8-1325 Dresden Row Halifax, NS B3J 2J9 Tel: (902) 422-4345 hboyd@ns.sympatico.ca
Heather Breeze	Biologist, Fisheries & Ocean Canada, Oceans and Coastal Management Division	Bedford Institute of Oceanography PO Box 1006 Dartmouth, NS B2Y 4A2 Tel: (902) 426-9851 Fax: (902) 426-3855 BreezeH@mar.dfo-mpo.gc.ca
John Charles	Open Space Planner, Halifax Regional Municipality	Halifax Ferry Terminal Building PO Box 1749 Halifax, NS B3J 3A5 Tel: (902) 490 5771 Fax: (902) 490 5730 charlej@region.halifax.ns.ca
Tony Charles	Management Science / Environmental Studies Saint Mary's University	Saint Mary's University Halifax, NS B3H3C3 Tel: (902) 420-5732 Fax: (902) 496-8101 tony.charles@smu.ca
Scott Coffen-Smout	Fisheries & Ocean Canada Oceans and Coastal Management Division	Bedford Institute of Oceanography PO Box 1006 Dartmouth, NS B2Y 4A2 Tel: (902) 426-2009 Fax: (902) 426-3855 coffen-smouts@mar.dfo-mpo.gc.ca
Joan Czapalay	Sable Island Preservation Trust	1370 Robie Street, Suite #8 Halifax, Nova Scotia B3H 3E2 Tel: (902) 431-8727 Summer: (902) 348-2803 joancz@ns.sympatico.ca

Name of Participant	Organization	Contact Details
Marie-France Dalcourt	Chef, gestion intégrée Direction des océans et de l'habitat. Fisheries & Ocean Canada	Institut Maurice-Lamontagne 850, route de la Mer C.P. 1000 Mont-Joli, Québec Tel: (418) 775-0873 Fax: (418) 775-0718 dalcourtmf@dfo-mpo.gc.ca
Lisa DeBaie	Environment – Economy Environment Canada, Atlantic Region	Environment Canada 45 Alderney Drive Dartmouth, NS B2Y 2N6 Tel: (902) 426-8879 Fax: (902) 426-6348 Lisa.DeBaie@ec.gc.ca
Kim Doane	Nova Scotia Petroleum Directorate	Suite 400 Bank of Montreal Building 5151 George Street P.O. Box 2664 Halifax, Nova Scotia B3J 3P7 Tel: (902) 424-7146 Fax: (902) 424-0528 doaneka@gov.ns.ca
Dave Duggan	Head, Coastal Management Section, Fisheries & Oceans Canada, Oceans & Habitat Branch	Bedford Institute of Oceanography PO Box 1006 Dartmouth, NS B2Y 4A2 Tel: (902) 426-6183 Fax: (902) 426-3855 duggand@mar.dfo-mpo.gc.ca
Kelley Fraser	Environmental Scientist, Jacques Whitford Limited	Jacques Whitford Building 3 Spectacle Lake Drive Dartmouth, NS B3B 1W8 Tel: (902) 468-7777 x 380 Fax: (902) 468-9009 kelley.fraser@jacqueswhitford.com
Jeremy Gammon	Staff Officer Natural Resources Management, Department of National Defence Maritime Forces Atlantic	Department of National Defence PO Box 99000 Stn Forces Halifax, NS B3K 5X5 Tel: (902) 427-0550 x 8340 Fax: (902) 427-5417 gammon.jp@forces.gc.ca
Brian Giroux	Scotia-Fundy Mobile Gear Fishermen's Association	33 Chestnut Street Yarmouth, NS B5A 2N7 Office: (902) 742-6732 Fax: (902) 742-6732 sfmobile@fox.nstn.ca
Gerry Gravel	Statistics Canada	120 Parkdale Avenue Ottawa, Ontario K1A 0T6 Tel: (613) 951-1897 Fax: (613) 951-0634 gerry.gravel@statcan.ca
Tim Hall	Section Head, Oceans Management Section, Fisheries and Oceans Canada, Oceans and Coastal Management Division	Bedford Institute of Oceanography PO Box 1006 Dartmouth, NS B2Y 4A2 Tel: (902) 426-4116 Fax: (902) 426-3855 halltj@mar.dfo-mpo.gc.ca

Name of Participant	Organization	Contact Details
Carolyn Hedley	Canadian Parks and Wilderness Society (CPAWS); Master of Environmental Studies Candidate	School for Resource and Environmental Studies, Dalhousie University 1322 Robie Street Halifax, NS B3H 3J5 Phone: (902) 494-3632 Fax: (902) 494-3728 chedley@dal.ca
Glen Herbert	Fisheries & Ocean Canada, Oceans and Coastal Management Division	Bedford Institute of Oceanography PO Box 1006 Dartmouth, NS B2Y 4A2 Tel: (902) 426-9900 Fax: (902) 426-3855 herbertg@mar.dfo-mpo.gc.ca
Justin Huston	Coastal Zone Coordinator, NS Department of Agriculture and Fisheries	Bank of Montreal Tower, 7th Floor 5151 George Street PO Box 2223 Halifax, NS B3J 3C4 Tel: (902) 424-2996 Fax: (902) 424-1766 HustonJE@gov.ns.ca
Marty Janowitz	VP Marketing & Branding Jacques Whitford Limited	Jacques Whitford Building 3 Spectacle Lake Drive Dartmouth, NS B3B 1W8 Tel: (902) 468-7777 x 406 Fax: (902) 468-9009 mjanowit@jacqueswhitford.com
Ibrahim Khan	PhD Fellow, Dalhousie University	D510-1360 Barrington Street Halifax, NS B3J 2X4 Tel: (902) 423-2045 Fax: (902) 494-6526 mikhan@dal.ca
Ross Lee	Ivalee Enterprises	58 Walnut St Bridgewater, NS B4V 1L6 Tel: (902) 543-2556 or 902-543-6211 Fax: (902) 527-2116 ivalee@ns.sympatico.ca
Geoff Lewis	Industry Canada, Energy & Marine Branch	1800 Argyle Street 5th Floor P. O. Box 940, Station M Halifax, NS B3J 2V9 Tel: (902) 426-9475 Fax: (902) 426-5218 lewis.geoff@ic.gc.ca
Paul MacNab	Fisheries & Ocean Canada, Oceans and Coastal Management Division	Bedford Institute of Oceanography PO Box 1006 Dartmouth, NS B2Y 4A2 Tel: (902) 426-6391 Fax: (902) 426-3855 MacnabP@mar.dfo-mpo.gc.ca
Karen McNulty	Guysborough County Regional Development Authority	PO Box 49 Guysborough, NS B0H 1N0 Tel: (902) 533-2890 Fax: (902) 533-2064 kmcnulty@gerda.ns.ca

Name of Participant	Organization	Contact Details
Cathy Merriman	World Wildlife Fund Canada	5251 Duke Street, Suite 1202 Halifax, NS B3J 1P3 Tel: (902) 482-1105 Fax: (902) 482-1107 cmerriman@wwfcanada.org
Kim Paul	Union of Nova Scotia Indians	47 Mallard St., Membertou Tel: (902) 539-4107 or (902) 564-5628 Fax: (902) 564-2137 environment@unsi.ns.ca
Murray Rudd	Senior Economic Analyst Fisheries and Oceans Canada Economic Analysis Division	Marine House 176 Portland Street PO Box 1035 Dartmouth, NS B2Y 4T3 Tel: (902) 426-4825 Fax: (902) 426-6767 ruddm@mar.dfo-mpo.gc.ca
Bruce Smith	BLSmith Groupwork Inc.	PO Box 716 60 Sand Beach Road Liverpool, NS B0T 1K0 Tel: (902) 354-3316 blsmith@groupwork.ns.ca
Kenny Snow	Guysborough County Inshore Fishermen's Association	P.O. Box 98 Canso, NS B0H 1H0 Tel: (902) 366-2266 Fax: (902) 366-2679 gcifa@ns.sympatico.ca
Bob St. Laurent	Oceans Planning & Policy Officer, Fisheries and Oceans Canada, Oceans and Coastal Management Division	Bedford Institute of Oceanography PO Box 1006 Dartmouth, NS B2Y 4A2 Tel: (902) 426-6048 Fax: (902) 426-3855 StLaurentB@mar.dfo-mpo.gc.ca
Janet Trider	Seafood Producers Assoc. of Nova Scotia	PO Box 991 Dartmouth, NS B2Y 3Z6 Tel: (902) 463 7790 Fax: (902) 469-8294 sfarwell@ns.sympatico.ca
David VanderZwaag	Dalhousie Marine and Environmental Law Institute, Dalhousie University	6061 University Avenue Halifax, NS B3H 4H9 Tel: (902) 494-1045 Fax: (902) 494-1316 david.vanderzwaag@dal.ca
Danny Walmsley	Walmsley Environmental Consultants	22 Amethyst Crescent Dartmouth, NS B2V 2T7 Tel/Fax: (902) 433-0819 danwalmsley@ns.sympatico.ca
Jay Walmsley	Environmental Scientist, Jacques Whitford Limited	Jacques Whitford Building 3 Spectacle Lake Drive Dartmouth, NS B3B 1W8 Tel: 902-468-7777 x 259 Fax: 902-468-9009 jay.walmsley@jacqueswhitford.com

Name of Participant	Organization	Contact Details
Alasdair Wilkie	Hibernia Atlantic	Herring Cove Centre 132 Ketch Harbour Rd. Halifax, NS B3V 1J4 Tel in Dublin: (353) 1867-3643 Canada: (902) 479-5200 Fax: (902) 479-5235 alsadair.wilkie@hiberniaatlantic.com
Darren Williams	Oceans Policy Advisor, Oceans Directorate, Fisheries and Oceans Canada	Room 12E-246, 200 Kent St. Ottawa, Ontario K1A 0E6 Tel: (613) 993-228 Fax: (613) 993-6414 Williamd@dfo-mpo.gc.ca
Trudy Wilson	Assistant Regional Director, Fisheries and Oceans Canada, Regional Director's Office	PO Box 1006 Dartmouth, NS B2Y 4A2 Tel: (902) 426-6386 Fax: (902) 426-9909 WilsonT@mar.dfo-mpo.gc.ca

Annex 3
Presentations

Context for the Development of Human Use Objectives

Tim Hall, Ocean and Coastal Management Division, DFO

The Eastern Scotian Shelf Integrated Management (ESSIM) Initiative

*Context for the development of
Human Use Objectives*

Tim Hall
ESSIM Planning Office
Oceans and Coastal Management Division
Dec 1st 2004



Fisheries and Oceans
Canada

Pêches et Océans
Canada



Outline

- The ESSIM Initiative
- The IM Plan
 - Objectives-Based Management
 - Collaborative Planning Model
- Plan Development Timeline

What is the ESSIM Initiative?

- **Integrated Management** is "a commitment to planning and managing human activities in a comprehensive manner ... considering all factors necessary for the conservation and sustainable use of marine resources and the shared use of ocean spaces."
(*Canada's Oceans Strategy*)
- ESSIM is a collaborative, offshore integrated management initiative for the Eastern Scotian Shelf, led by DFO's Oceans and Coastal Management Division.
- Engages all stakeholders (including relevant government bodies) to develop and implement an integrated ocean management plan for the area.

A Brief History

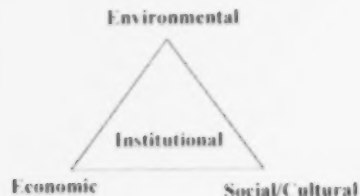
- *1998 Sable Gully Conservation Strategy* recommends IM on the Eastern Scotian Shelf.
- *Dec. 1998* ESSIM announced as first IM pilot project with an offshore focus.
- *February 2002* 1st ESSIM Forum Workshop held.
- *February 2003* 2nd Forum Workshop. Strategic Planning Framework presented.
- *2003-Present*: Draft plan under development; collaborative planning process being designed, human use and ecosystem objectives being identified, ocean use atlas being created.

National & International Context

- 1997 *Oceans Act* provides legal basis
- *Canada's Oceans Strategy* affirms IM as a priority
- *National IM Policy and Operational Framework* provides guidance
- Reflects our international legal commitments
- Similar initiatives elsewhere in Canada, such as BC Central Coast
- Related initiatives in other countries, such as Australia and Ireland

The ESSIM Mission

An effective, collaborative process that provides integrated and adaptive management plans, strategies and actions for environmental, social, cultural, economic and institutional sustainability in the Eastern Scotian Shelf Integrated Management Area



ESSIM Goals

The overall goals of the ESSIM Initiative are:

- to integrate the management of all measures and activities in or affecting the ESSIM planning area;
- to manage for conservation, sustainability and responsible use of ocean space and marine resources;
- to restore and maintain natural biological diversity and productivity; and
- to provide opportunities for economic diversification and sustainable wealth generation to foster social well-being for coastal communities and stakeholders.

The future ocean management plan will include a detailed set of environmental, social, economic and institutional objectives, as well as strategies for their achievement.

The Planning Area

- Boundaries based on ecological, ocean use, political, and administrative criteria.
- Corresponds to NAFO Division 4VW.
- Extends from coast to offshore limit of Canadian jurisdiction.
- Focus is the offshore.
- Coastal areas in the future with Province & communities.
- Considering expansion to Northeast Channel to include entire Scotian Shelf.
- Create a planning area that better conforms to ecological boundaries, human use patterns, and existing data sets.



Human Use

- **Multiple uses:**
 - commercial fisheries
 - offshore oil & gas
 - Shipping
 - maritime defence
 - submarine cables
 - research and development
 - recreation and tourism
 - marine conservation, and
 - potential offshore minerals development.
- Real and potential conflicts among users, and impacts on ecosystem.

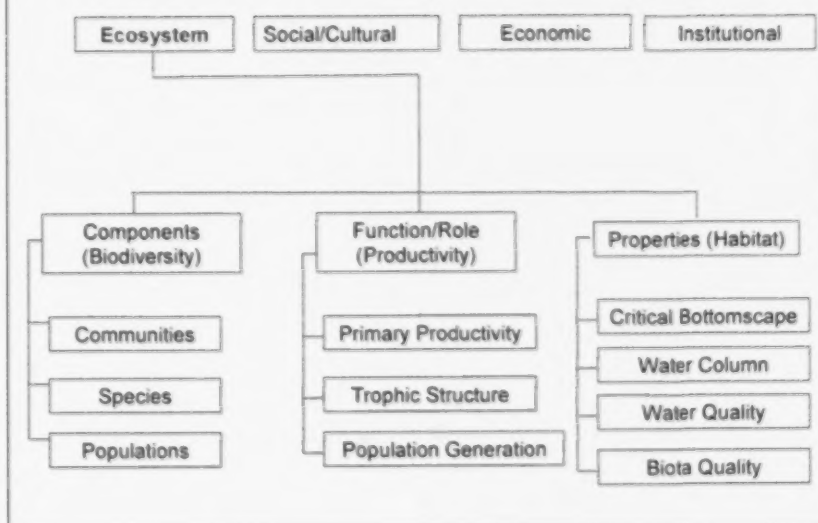
The ESSIM Plan

- Multi-year, strategic level plan to provide long-term direction and common basis for integrated, ecosystem-based and adaptive management of all marine activities.
- Focus on management needs and priorities related to:
 - multiple ocean use;
 - ecosystem conservation and protection; and
 - intergovernmental coordination.
- Umbrella for various ocean sector management processes, built on and supported by existing management jurisdictions and responsibilities.
- Will effectively link sector-based planning and decision-making to an overarching set of objectives, actions and outcomes for the planning area (*i.e.*, outcomes-focussed).

Objectives-Based Management

- Core of the plan is a framework of ecosystem and human use management objectives, indicators, and related management strategies and actions:
 - Ecosystem objectives relate to conserving biodiversity, productivity and habitat
 - Human use objectives relate to social, cultural, economic and institutional aspects
- Indicators will be developed as measures for monitoring broad-scale objectives related to, for example, community well-being, wealth generation...
- Multi-stakeholder Working Groups have prepared draft objectives that are being refined through expert workshops for input into the draft ESSIM plan:
 - Human Use Objectives Workshop (December 2004)
 - Ecosystem Objectives Workshop (early Winter 2005)

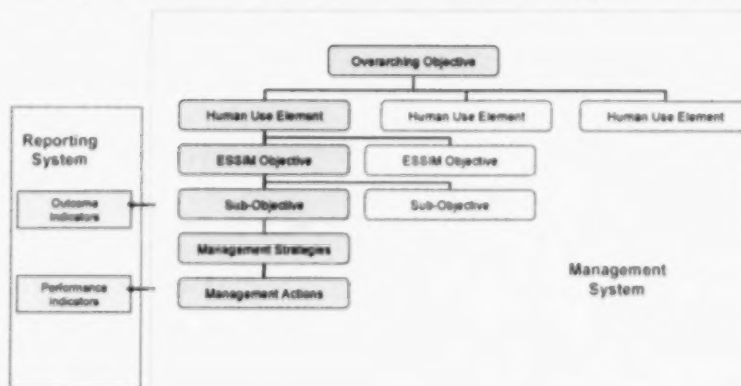
“Dunsmuir” Ecosystem Objectives



Ecosystem Objectives

- DFO ESSIM Science Working Group is planning an expert workshop on ecosystem objectives this FY.
- Detailed worksheets are being prepared for a set of proposed objectives (based on work by multi-stakeholder sub-regional WG).
- These worksheets will provide consistent information on the objectives, including:
 - ecosystem components involved
 - sectors involved
 - reference points (limit/target)
 - indicators
 - potential management strategies
 - research required
- A "context" document, containing relevant technical information about the ESSIM area, is also being prepared to support the worksheet preparation.

Objectives-Based Management



IM Tools

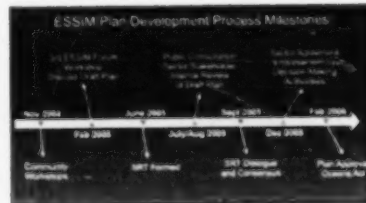
- Objectives-based structure will provide:
 - clearly stated long-term, overarching management objectives, supported by measurable operational objectives, targets and indicators;
 - built-in risk analysis process for evaluating management options; and
 - regular monitoring and review of plan performance.
- The plan will be supported by area-based management and risk assessment tools (e.g., GIS).
- Bi-annual action plans will enable effective and adaptive priority setting and plan implementation.

Collaborative Planning

- Work of developing and implementing the management plan is done by all sectors and stakeholders through consensus.
- Does not supersede authority of government bodies to carry out their existing mandates.
- Three integral components: the ESSIM Forum; the Stakeholder Roundtable; and the Planning Office.

The Way Forward

- Develop draft plan.
- Present to ESSIM Forum (Feb 22nd and 23rd 2005).
- Review, develop, and revise plan.
- Sectors and decision-makers endorse plan.
- Minister approves plan.
- Implement plan. Develop implementation 'Action Plans' where needed.
- Monitor, evaluate, adapt.



Proposed Human Use Objectives and Indicators Framework

Scott Coffen-Smout, Ocean and Coastal Management Division, DFO
Jay Walmsley, Jacques Whitford

ESSIM Human Use Objectives Sub-Working Group

Kim Doane (NS Energy), Murray Rudd (DFO),
Jay Walmsley (Jacques Whitford), Rosanne LeBlanc (DFO),
Richard Apostle (Dalhousie University), Cathy Merriman (WWF),
Sandra Farwell Scarfone (SPANS), Heather Breeze (DFO),
Scott Coffen-Smout (DFO), Eric Theriault, (CNSOPB)

Background

- Sub-group of multistakeholder sub-regional planning group to develop a prototype integrated management plan for a selected ecosystem sub-unit, i.e., Sable-Banquereau and the Slope waters;
- An OCMD working paper and the *Strategic Planning Framework* formed the basis of background materials;
- No national monitoring framework, guidelines or reference for development of human use framework
- Tasked to develop socio-economic, cultural and institutional (governance) objectives and indicators as monitoring and performance measures for the ESSIM Plan;
- Complete the planning cycle for a selected area and provide a practical illustration of the integrated management and planning process;
- Results to be reported at the 3rd ESSIM Forum Workshop.

Activities

- "Unpacked" high-level management objectives for socio-economic, cultural, institutional/ governance aspects;
- Influenced by Treasury Board's audit and performance measures and Murray Rudd's work on monitoring system sustainability and management performance;
- Articulated high-level overarching objective and more specific sub-objectives and indicators in support of the broader ESSIM management objectives in four "human use elements"; and
- Developed an operational monitoring framework for the prototype plan.

Draft Human Use Objectives

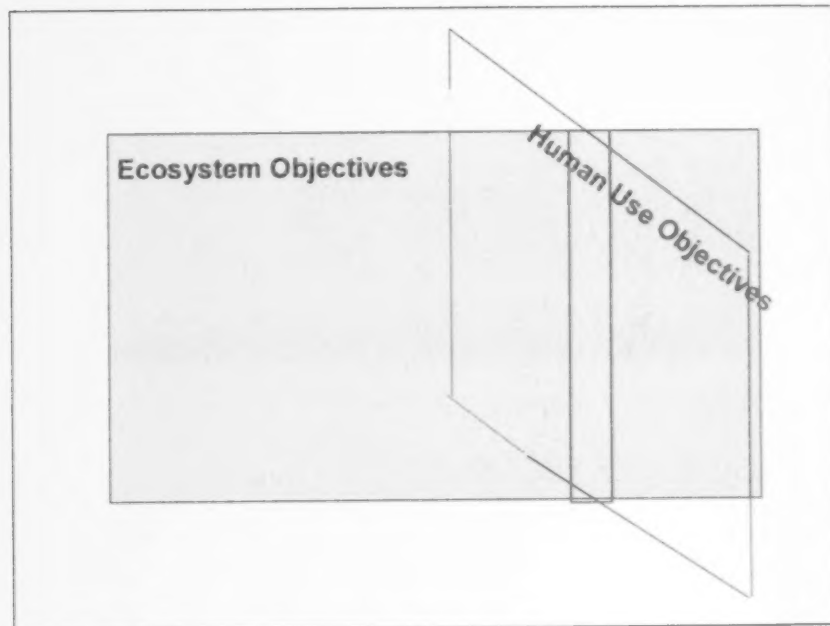
Overarching Objective (Proposed)
To provide opportunities for economic diversification and sustainable wealth generation to foster social well-being for coastal communities and stakeholders.
Human Use Elements
Community Well-being
Wealth Generation
Industrial Capacity and Assets (Oil and Gas)
Industrial Capacity and Assets (Shipping)
Industrial Capacity and Assets (Fisheries)
Industrial Capacity and Assets (Government Activity)
Integrated Management Process

Drafted fact sheets with statement of objective, definition of purpose & scope, potential indicators, linkages to other objectives and indicators

Draft Human Use Objectives

	ESSIM Objective	
Community Well-being Ensure that the well-being of Nova Scotian communities is maintained or increased now and in the future	Livelihood opportunities	Jobs available in a variety of sectors Quality of jobs
	Communities resilient to change	Economic, educational opportunities
	Community participation in ESSIM decision-making	Representation in ESSIM bodies Government-community relationships
	Education and skill levels maintained / improved	No. of school / university graduates, % Literacy
	Basic services and infrastructure adequate	Phone lines, broadband, sewerage, water, etc.

[illegible]



Outcomes

- Original goal – to develop a plan for the sub-regional area – was not attained;
- Progress made on operational framework, but unpacking process was slow;
- Work aimed at Shelf-wide scale rather than sub-region:
 - scale did not limit the issues to be considered
 - appropriate scale at which human use data are collected
 - objectives and indicators more applicable at Shelf-scale
- Members recommended convening a workshop.

Lessons Learned

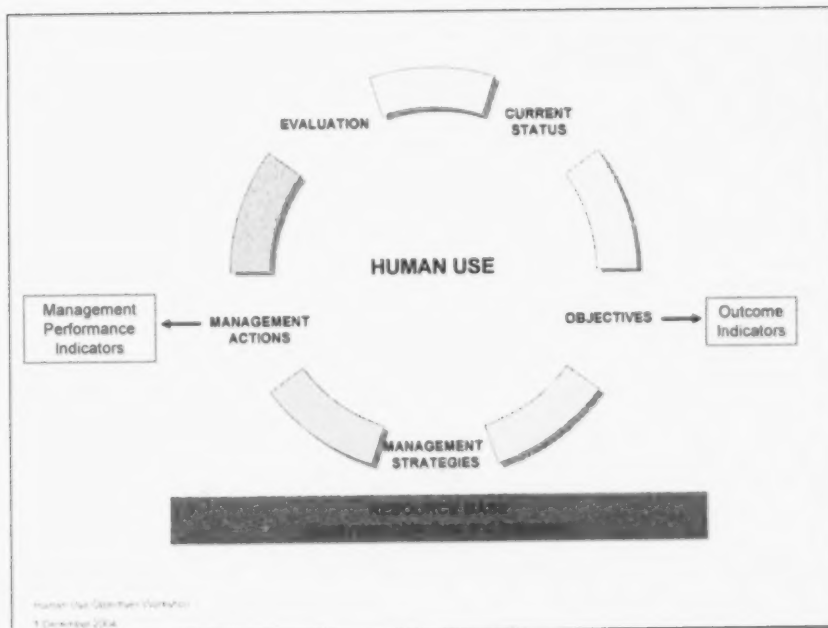
- Very much an exploratory exercise – TORs and a tight work-plan did not necessarily help the group advance.
- Progress was slow and iterative.
- Paper outputs not the ultimate measure of success; the process of engagement and cooperation is an outcome.
- Forming the “right team” in terms of skills and personalities is important; human perspectives and biases are key determinants of the Working Group's product.
- Participation on the working group not as broad and diverse as it should have been -- would have benefited from greater expertise in indicator development.
- Working at the right level of detail for the task at hand and to the strengths of the Working Group is important.
- When dealing with complex tasks, avoid minute details and maintain the bigger picture of what needs to be done.

Next Steps – Timelines

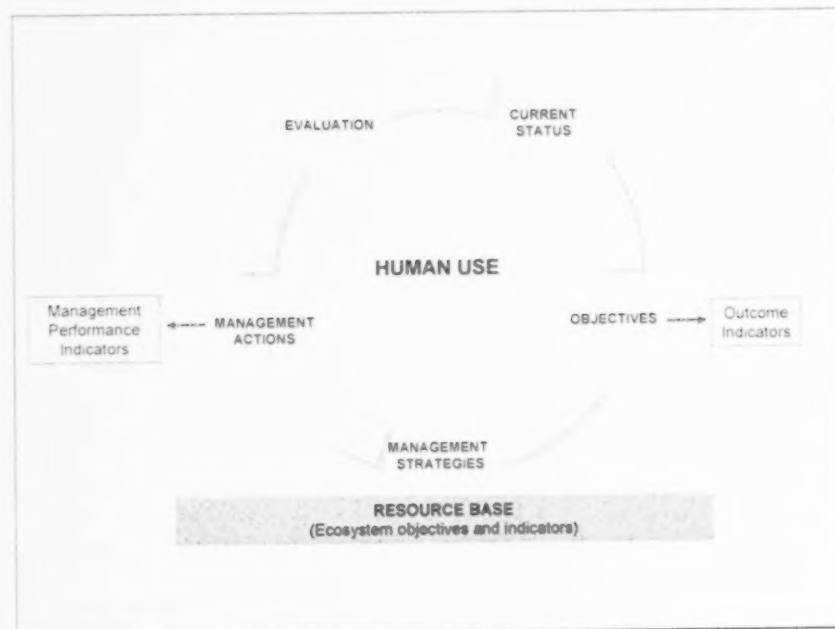
- Workshop output of reviewed human use objectives and indicators framework to feed into the ESSIM Plan
- ESSIM Online Discussion on Human Use Objectives (January 2005)
- Input to 3rd ESSIM Forum Workshop (22-23 February 2005)

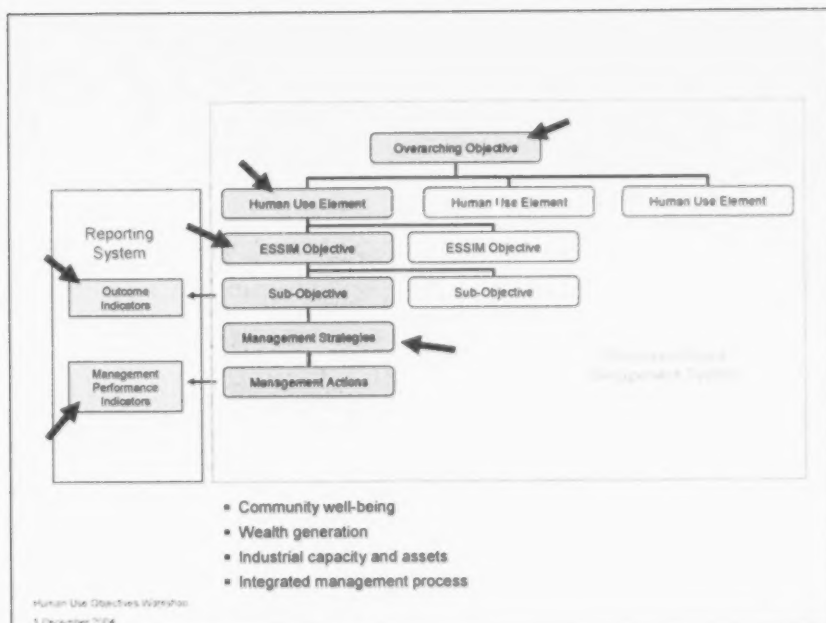
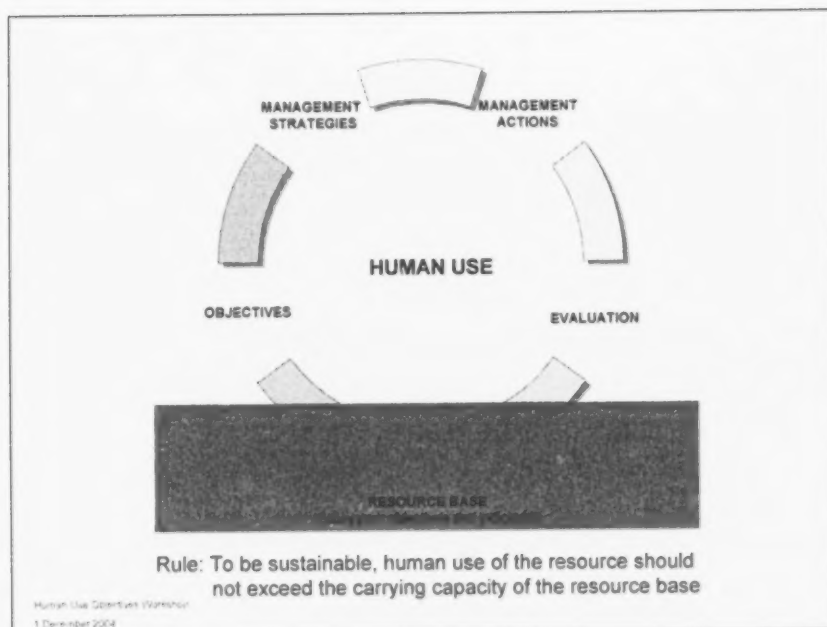
Human Use Objectives Framework

Human Use Objectives Workshop
1 December 2004



Human Use Objectives Framework





Reporting System

Indicator:

A parameter that provides information about an environmental issue with a significance that extends beyond the parameter itself

Outcome Indicators

Has there been any improvement to the system?
To what degree have the objectives been met?

=

Measurement of the success of the management strategies

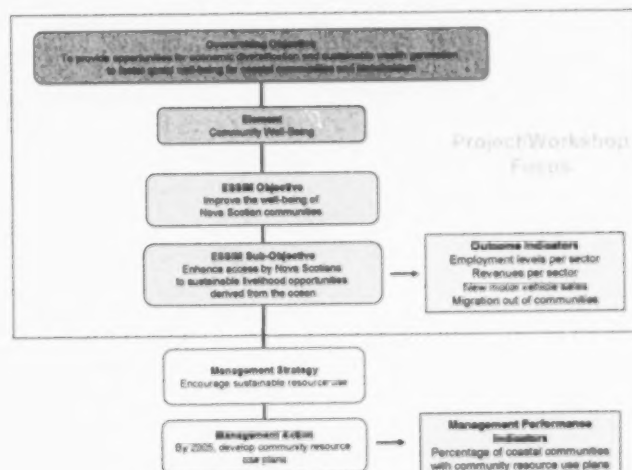
Management Performance Indicators

Have the management actions been undertaken or to what degree have they been performed?

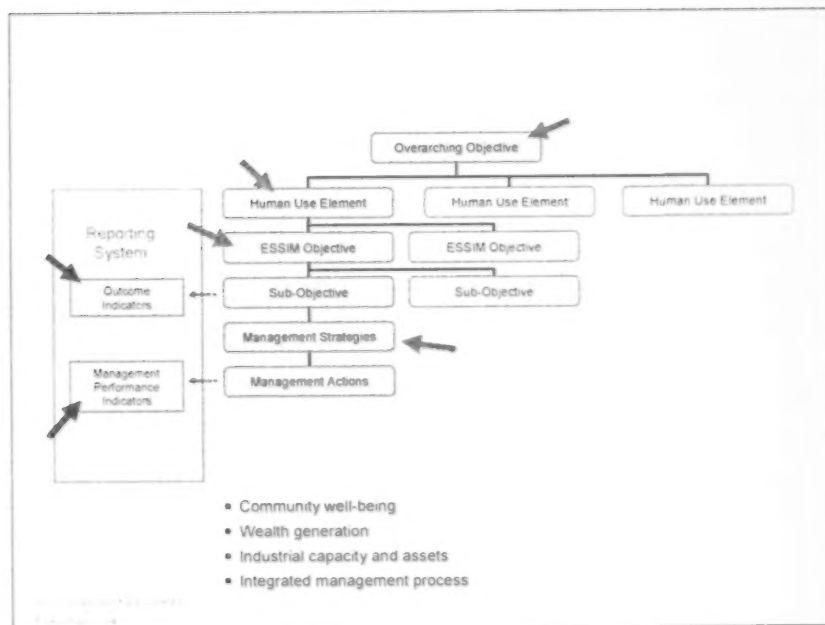
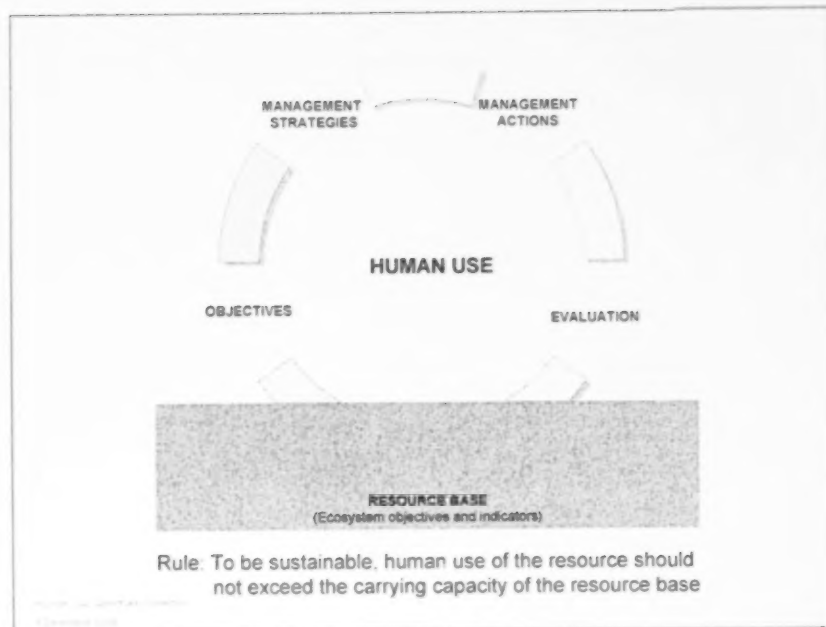
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Measurement of implementation

Human Use Objectives Workshop
1 December 2004



Human Use Objectives Workshop
1 December 2004



Reporting System

Indicator:

A parameter that provides information about an environmental issue with a significance that extends beyond the parameter itself

Outcome Indicators

Has there been any improvement to the system?
To what degree have the objectives been met?

=

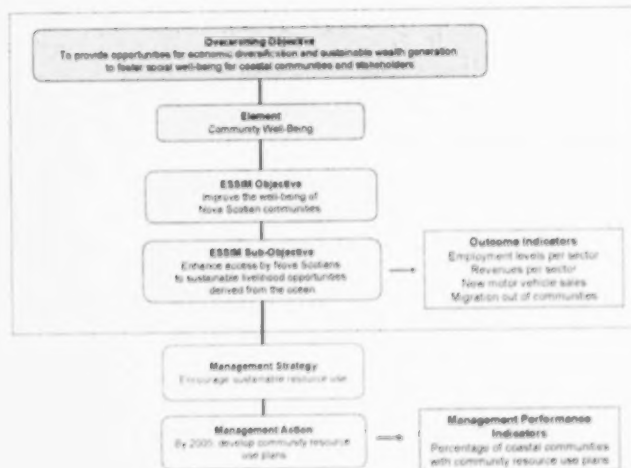
Measurement of the success of the management strategies

Management Performance Indicators

Have the management actions been undertaken or to what degree have they been performed?

=

Measurement of implementation



APPENDIX C

**OBJECTIVES AND INDICATORS
FACT SHEETS**

Community Well-Being

ESSIM Objective:

***To contribute to the long-term social and cultural
well-being of communities in Nova Scotia***

Code	CWB1
Human Use Element	Community Well-Being
ESSIM Objective	To contribute to the long-term social and cultural well-being of communities in Nova Scotia
Sub-Objective	Access by coastal communities and all Nova Scotians to sustainable livelihood opportunities derived from ocean resources

Definition of Sub-Objective

Sustainable livelihoods are derived from people's capacity to exercise choice, access opportunities and resources, and use them for their livelihoods in ways that do not foreclose options for others to make their living, either now, or in the future (<http://www.undp.org/sl/Introduction/introduction.htm> 2003). Thus the outcome would be that the people, and thus communities, have access to a variety of livelihood opportunities that they are able to choose between, based on the resources of the Scotian Shelf. In addition, they should have the legal rights to that access, or permission to use the resources (or knowledge of how to gain permission), and the capacity to implement livelihood activities.

Relevance to ESSIM

In order to meet the ESSIM objective to ensure the well-being of Nova Scotian communities that are dependent on ocean resources, they must have access to a variety of livelihood opportunities. In this context, the communities' livelihoods would be dependent directly (e.g., fishing; whale watching) or indirectly (e.g., processing; boat building) on the resources of the Scotian Shelf.

The issues related to access to the resources differ from activity to activity. For example:

- Fishermen are required according to the *Fisheries Act* to have species-specific fishing licenses before fishing may commence. Access is also restricted by the capital input required to run a fishing operation, as well as natural conditions that may limit fishing days (e.g., weather). Fishing licenses are directly related to quotas for each fishery, which are based on sustainable catch rates, linking back to ecosystem objectives and requirements.
- First Nations rights are specified under the *Constitution Act* and the *Indian Act*. However, commercial fisheries licenses are issued under the *Fisheries Act* and access to the fisheries resources of the Scotian Shelf is limited by the same access issues as mentioned above.
- Although oil and gas ventures are not linked to a single community, access issues related to the industry are worth mentioning. The Canada-Nova Scotia Offshore Petroleum Board regulates the oil and gas industry through the *Canada-Nova Scotia Petroleum Resources Accord Implementation (Nova Scotia) Act*. Exploration Licenses (blocks of various sizes in the offshore) are leased for a limited period. Proponents are required to obtain a Drilling

Program Authorization and Approval to Drill a Well before conducting drilling operations. Currently, these approvals trigger the requirement for an environmental assessment to be undertaken (under the *Canadian Environmental Assessment Act*) before drilling operations begin. Capital costs are large for this type of operation and access by communities is through employment by large oil and gas companies.

Linkages

This sub-objective links to:

- Ecosystem objectives and indicators for target fisheries; and
- Other community well-being objectives.

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Provincial employment levels per sector (no. of people)	Employment levels provide an indication of how many people have access to the benefits of using resources. The main sectors for which this can be calculated include fishing, oil and gas, shipping and eco-tourism. Trend analysis over time would provide an indication of changing resource access.	Stats Canada	The statistics for some sectors may not be directly related to ocean use.
Legal requirements for access per sector (qualitative explanation)	This would provide an indication of how difficult it is for a group to gain preliminary access to a resource.	Review of legislation and regulations per sector	This is unlikely to change considerably over time, and is a qualitative indicator
Number of licenses issued per sector (no.)	This indicator could be a proxy for provincial employment levels per sector.	DFO; CNSOPB; Transport Canada etc.	This indicator does not show how many people have access to a resource.
Capital outlay and operating costs per sector per annum (\$/annum)	This provides an indication of the financial resources required to have access to the ocean resources on an annual basis. Capital outlay provides an indication of equipment requirements, while operating costs are ongoing costs.	Sectoral representatives	The main problem with this indicator is likely to be data gathering. Organizations may not be willing to provide the information required

Potential Problems

It should be recognized that ESSIM may not have influence over all aspects of access to resources. For instance, industrial capacity may not be as easy to influence as regulatory requirements.

Code	CWB2
Human Use Element	Community Well-Being
ESSIM Objective	To contribute to the long-term social and cultural well-being of communities in Nova Scotia
Sub-Objective	Nova Scotian community resilience

Definition of Sub-Objective

Resilience reflects the ability of a community to "bounce back" from shocks, which may include changes in the resource base or in the overall economic system (Charles *et al.* 2002). Factors that may contribute to community resilience include: debt levels (negative), diversification of economic activities (positive), diversity of age structure, and extent of community economic development initiatives.

Relevance to ESSIM

The effect of the collapse of the cod fishery on fisheries communities in Nova Scotia is a good example of where a lack of community resilience can lead. If a community is resilient, it will not be as sensitive to the effect of ecosystem changes on the Scotian Shelf. To understand how ESSIM may influence community resilience, it is necessary to have a more detailed understanding of the attributes that contribute to community resilience.

High or excessive debt levels and high payments on debt are likely to reduce a community's capability to adapt to changing circumstances. Diversification of economic activities may be through community members undertaking more than a single economic activity (*e.g.*, seasonal work) or through diversification of the resources utilized (*e.g.*, multi-species fishery). A well-distributed age structure in a community ensures a range of beneficial social interactions, as well as ensuring continuity within the dominant economic activities (*e.g.*, fishing). The extent of economic development initiatives are discussed under *Economic Well-Being*.

In essence, ESSIM's role will be to encourage a diversity of ocean uses through collaborative governance and decision-making. It is unlikely that ESSIM will be able to directly influence aspects such as debt levels and age structures, but by encouraging other ocean uses, and providing good information on the resource base, ESSIM can contribute to community resilience.

Linkages

This sub-objective links to:

- CWB3: *Ocean-related education, training and awareness enhanced;*
- Economic well-being; and
- Industrial capacity and assets.

Recommended Outcome Indicators

It is recommended that pilot communities, for which the following outcome indicators can be calculated on an annual or biennial basis, be chosen. Criteria for choosing the pilot communities include:

- Within a well-defined geographical area (e.g., Sheet Harbour);
- Share a common culture and understanding (e.g., fishing community; First Nations);
- May be "key" communities that have contributed to resource management in Nova Scotia previously (e.g., Eskasoni); and
- Are willing to participate.

Indicator	Meaning	Possible Data Sources	Shortcomings
Reported bankruptcies (no.)	Bankruptcies prove an indication of extreme debt levels in a community.	Stats Canada	Information may not be readily available
Debt levels per annum (\$)	Alternative to "reported bankruptcies"	Stats Canada	Information may not be readily available
Marine fisheries landed value by type of fish (\$/per type)	Provides an indication of diversity of resources utilized for fishing communities.	DFO	Can only be used in communities that are involved in the offshore marine fishery
Age structure of community (years)	Age structure provides an indication of resilience over time.	Stats Canada	None identified
Income from economic activities (\$/activity)	Provides a direct measure of the number of economic activities that people may be involved in.	Survey	Without an annual/biennial survey and the participation of the community, it will be difficult to obtain data. A proxy may be <i>employment levels per sector</i> (see comment below).

Indicators provided under CWB1 could also be used at a community level to supplement the information required under CWB2, e.g., *employment levels per sector*.

Potential Problems

Implementation of this objective is complicated by sectoral differences. This can be partly overcome in the reporting framework by the selection of pilot communities. It is unlikely that ESSIM will be able to directly influence community resilience except through capacity building and collaborative governance.

Code	CWB3
Human Use Element	Community Well-Being
ESSIM Objective	To contribute to the long-term social and cultural well-being of communities in Nova Scotia
Sub-Objective	Ocean-related education, training and awareness enhanced

Definition of Sub-Objective

The objective is to encourage appropriate education and training with regard to conservation and use of the ocean space and resources within Nova Scotian communities. It is viewed as a tool to empower communities by increasing understanding with regard to resource use, as well as providing them with alternatives through education and skills training.

Relevance to ESSIM

Ocean education, training and awareness can take place at different levels. Education may include any form of ocean-related education from primary level up to university-level education. It could include preparation of materials (based on experience on the Scotian Shelf) for teaching at schools, as well as negotiating with school boards to include materials into the curricula at various levels. The benefit of ocean-related education at this level is that children often indirectly educate their parents. Effort may also be aimed at tertiary institutions, particularly those that provide recognized marine-related programs already. This may be in the form of lectures and seminars.

Training is essential to improve skills that are occupation-based. Such training could include, for instance, safety at sea, pollution control and best practices, or alternative livelihoods. This is directly linked to community resilience, and ensuring that people have the range of skills required for a diverse economic base. It is essential that all Nova Scotians be provided with equal opportunity to attend these programs as appropriate.

Awareness is more broadly based than education and training. It generally requires some form of communications program and is aimed at a wider audience. It could include newsletters, press releases, and radio and television communication, among others.

In general, increased education, training and awareness provide capacity-building opportunities to communities. Indirectly this will improve access to resources, as well as community resilience. Also capacity building is often required for participative governance to be successful.

Linkages

This sub-objective is linked to:

- Sub-objective CBW 1: *Access by coastal communities and all Nova Scotians to sustainable livelihood opportunities derived from ocean resources;*
- Sub-objective CBW2: *Nova Scotian community resilience;*
- Economic well-being; and

- Integrated management process, particularly IMP5: *An effective communication system by which the public and stakeholders are made aware of, and are able to understand, ESSIM in terms of decisions, activities and implications.*

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Percentage of children at high school level who have understanding of ocean-related issues	Provides an indication of the outcome that there is ocean-related education at schools.	Survey required at a sample of Nova Scotian schools	The indicator requires adequate human and financial resources to implement.
Number of ocean-related curriculum elements at elementary, junior high and high school levels by school board	This indicator is a proxy for the one provided above.	School boards	The indicator assumes that, if information is provided as part of a curriculum, then the children will have the knowledge. This is not always the case.
Number of graduates (bachelors, masters, doctoral) from recognized ocean-based university courses	Provides an indication of human resources available that have technical expertise at a tertiary educational level.	University records	Not all graduates will necessarily find employment in a marine related field, and many will return "home" to other provinces. The graduate success may not necessarily be related to ESSIM.
Number of certificates issued through approved training courses	Provides an indication of the number of people who have had skills training in specific occupation-related subjects	ESSIM, training institutions	The types of training courses will need to be identified by ESSIM. The indicator assumes that not all courses will be approved by ESSIM.
Number of public communications with regard to ESSIM per annum	This indicator gives an indication of the effort that has gone into awareness-building.	ESSIM Office	The indicator does not give information on the number of people receiving the information, or the impacts of that information.

Potential Problems

The achievement of this objective will require active involvement of the ESSIM Planning Office, and may require extensive human and financial resources to support initiatives.

Code	CWB4
Human Use Element	Community Well-Being
ESSIM Objective	To contribute to the long-term social and cultural well-being of communities in Nova Scotia
Sub-Objective	Ocean-related services and infrastructure are adequate

Definition of Sub-Objective

This sub-objective requires that ocean-related services (e.g., search and rescue; monitoring) and infrastructure (e.g., wharves; harbour facilities) meet the needs of Nova Scotian communities.

Relevance to ESSIM

In order for humans to make use of the ocean space and resources, adequate services and infrastructure need to be made available. In general, the infrastructure that is built up to assist in the utilization of ocean resources does not cater to the needs of Nova Scotian communities only, but also to other users from outside the province, including international shipping and tourism. This indirectly benefits Nova Scotians by providing jobs, as well as facilities. On a smaller scale, there is also a need for adequate local facilities throughout the province.

Services include activities such as search and rescue, piloting, monitoring and evaluation, as well as ocean governance. Ocean governance is covered under the Human Use Element: Integrated Management Process. Although these activities fall under a variety of different government departments, ESSIM should be in a position, at the very least, to identify needs and bring them to the attention of the appropriate authorities.

Linkages

This sub-objective links to:

- Sub-objective CBW 1: *Access by coastal communities and all Nova Scotians to sustainable livelihood opportunities derived from ocean resources;*
- Economic well-being;
- Integrated management process.

Recommended Outcome Indicators

The indicators recommended in the table below are generic indicators for this sub-objective. Additional stakeholder input is required with regard to identifying those services and infrastructure elements that are essential for the successful use of ocean space and resources on the Scotian Shelf.

Indicator	Meaning	Possible Data Sources	Shortcomings
Existing infrastructure/required infrastructure by type (ratio)	This indicator matches the current infrastructure with the requirements of Nova Scotian communities for each type of infrastructure identified.	Research required	The main difficulty lies in determining what the current and future requirements are.
Funding provided to ocean-related services per annum (\$/a)	Provides an indication of the effort put into the various activities per year.	Service authorities	This indicator may not relate directly back to the success of ESSIM, as it may be influenced by other factors.

Potential Problems

Generally, the infrastructure component of community well-being relates to community infrastructure, such as roads, schools, sewerage and telecommunications (Anielski *et al.* 2002; DFO and DFA 2004; Barbière 2003). This sub-objective is more limited due to the fact that it relates to ocean-related services and infrastructure only. Although these elements will contribute to the well-being of Nova Scotians, their presence or absence may not be crucial to determining overall well-being. Thus this sub-objective should be closely linked with other sub-objectives within Community Well-Being.

Code	CWB5
Human Use Element	Community Well-Being
ESSIM Objective	To contribute to the long-term social and cultural well-being of communities in Nova Scotia
Sub-Objective	Ocean-related human health, safety and security

Definition of Sub-Objective

Community well-being is enhanced by the provision of a safe, secure and healthy environment in which people can live and work. This sub-objective focuses on ocean-related health, safety and security only.

Relevance to ESSIM

This sub-objective covers three aspects: health, safety and security, all of which have different implications. Ocean-related human health is directly linked to marine environmental quality. In particular, pollution of the marine environment may have a direct link to the health of people using the resource (e.g., through contaminated seafood). Education and training are required for those people making use of ocean resources so that they understand the human health issues and how they can assist in preventing incidents. Marine quality aspects will need to be included in the education training and awareness sub-objective (CWB3).

Maritime safety covers a wide variety of activities and actions. These may be split into two main categories: (1) marine safety, which includes search and rescue, boat inspections, codes of conduct, regulatory enforcement etc., and (2) occupational safety, which varies by occupation. Marine safety is covered by a variety of national and international legislation, including the *Canada Shipping Act* and amendments and *International Convention for the Safety of Life at Sea (SOLAS)*, under the jurisdiction of Transport Canada and the Coast Guard. Occupational safety falls under the jurisdiction of Health Canada by means of the *Canada Labour Code*. In Nova Scotia, it is regulated by the *Occupational Health and Safety Act*, by which all Nova Scotian businesses are required to abide.

Security of Nova Scotians is ensured by securing the borders of the country up to the edge of the Territorial Sea and Contiguous Zone as defined in the *Oceans Act*, as well as protecting citizens from crime. Ocean-related security comes under the jurisdiction of the Department of National Defence and the Royal Canadian Mounted Police Marine Section.

To provide a good quality of life (well-being) for Nova Scotian communities, ESSIM will endeavor to enhance health, safety and security in the marine environment by working together with the regulatory authorities.

Linkages

This sub-objective is linked to:

- CWB3: *Ocean-related education, training and awareness enhanced*;
- Industrial capacity and assets; and
- Ecosystem Objectives Framework.

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Number of safety incidents reported by ocean-related industries, by sector and by type (no./annum)	The number of reported safety incidents provides an indication of the level of safety-awareness and care within each sector. Trend analysis will show the change over time.	CanOSH	There may not be a clear distinction between ocean-related incidents and non-ocean-related incidents.
Number of marine security incidents per year (no./annum)	Provides an indication of the number of security infringements in Nova Scotian waters every year.	DND; RCMP	This is not necessarily an indicator of well-being, and may need to be combined with an indicator such as the one below.
Perceived security level	This can be ascertained through a survey of communities (possibly the pilot communities of CBW2) to determine whether the people themselves feel safe and secure.	Survey	Requires financial and human resources.

Potential Problems

Because it is impossible to differentiate ocean-related illnesses from other illnesses, no indicators have been developed for the ocean-related health of Nova Scotian communities. This issue has a direct link to the Ecosystem Objectives Framework, in that it is related to the level of pollution in the environment and the quality of the marine environment (see ICA3: *Stewardship and best practices promoted*).

Economic Well-Being

ESSIM Objective:

To contribute to wealth generation through activities related to the ocean system and distribution according to societal objectives

Code	EWB1
Human Use Element	Economic Well-Being
ESSIM Objective	To contribute to wealth generation through activities related to the ocean system and distribution according to societal objectives
Sub-Objective	Generate wealth from the ocean by fostering new opportunities and supporting existing opportunities

Definition of Sub-Objective

This sub-objective supports the generation of wealth by utilizing the ocean space, living resources and non-living resources of the Scotian Shelf sustainably. The intention is that ESSIM support existing wealth generating activities, as well as taking an active role in promoting new, sustainable resource use activities or alternative livelihood opportunities in the form of spin-off industries.

Relevance to ESSIM

The current uses of the ocean are well-known and well-defined. The environmental issues surrounding these are also understood, and efforts are already being made to ensure that the oceans resources are used in a sustainable or environmentally acceptable way. For instance, licensed quotas in the fishing industry should be based on estimated allowable catches to maintain fishing effort within the bounds of the ecosystem resilience. The oil and gas industry is required to conduct environmental assessments as part of the Drilling Program Authorization and subsequent Development Plan Application processes. ESSIM should support existing sectors, particularly with regard to sustainable use.

As technologies improve, new opportunities may arise from the use of ocean space and resources. ESSIM envisages taking an active role in fostering and promoting new industries that may contribute to sustainable wealth generation. This is particularly important in Nova Scotia where there is currently a reliance on the benefits accruing from the oil and gas resources, which are finite resources that will eventually run out.

Linkages

This sub-objective should be linked to:

- Community well-being; and
- EWB3: *Efficiency of resource use and ocean space.*

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Annual contribution of ocean sectors to provincial GDP (\$/annum; % GDP)	If tracked over time, this will provide an indication of the monetary wealth generated each year, as well as the likely sustainability of the sector. This indicator should also provide information on new industries that may arise.	Stats Canada	This indicator assumes that monetary wealth will provide spin-offs that affect intangible benefits.
Real growth per sector per annum (%)	Provides an indication of the sectoral growth over time.	Stats Canada	Continued economic growth may not be sustainable. This indicator cannot stand on its own, but needs to be used in a complementary way with ecosystem indicators.
Genuine Progress Index	Provides an index of increased wealth that takes into consideration financial capital, natural capital, human capital and manufactured capital.	GPI Atlantic	The GPI is still in the initial stages of being developed
Number and value of new/emerging industries per annum (no.; \$/a)	Tracked over time, this will provide information on the progress made where new opportunities have presented themselves	Research/ESSIM Planning Office	This will require the ESSIM Planning Office to have an understanding of current activities, to identify new industries and keep track of them.

Potential Problems

The main concern with regard to this sub-objective is the actual influence that ESSIM can have on wealth generation. In a capitalist society such as is found in Canada, most of the decisions are based on profitability of a venture. Although ESSIM can provide information and promote certain sustainable activities, its influence will be limited.

Code	EWB2
Human Use Element	Economic Well-Being
ESSIM Objective	To contribute to wealth generation through activities related to the ocean system and distribution according to societal objectives
Sub-Objective	Access to and distribution of wealth and benefits within coastal communities/Nova Scotia/Canada

Definition of Sub-Objective

This sub-objective promotes equitable distribution of the wealth generated from the ocean. The net benefits should accrue first to Nova Scotian communities and then to broader Canadian society.

Relevance to ESSIM

Access to and distribution of wealth has far greater implications than just fair distribution of monetary benefits. It implies an improved quality of life, not just improved financial circumstances. Thus, it is directly linked to the community well-being objectives.

Access to wealth has three elements. These include:

- Access to resources in order to generate wealth - this has been dealt with in CWB1: *Access by coastal communities and all Nova Scotians to sustainable livelihood opportunities derived from ocean resources.*
- Access to resources in order to take advantage of intangible benefits, such as the intrinsic value of a resource. In other words, people benefit in an undefined way just by knowing that a resource is there and in a healthy condition. ESSIM can influence this by ensuring that the ecosystem of the Scotian Shelf is properly managed, that key habitats and species are protected and that marine protected areas are established.
- Access to the wealth that is generated through the use of ocean resources. In general, this occurs through the multiplier effect, which is a basic economic concept that refers to an injection of expenditure into an economy that leads to an increase in income more than the original injection. The multiplier effect is the continuous re-spending of incomes. It increases the benefits to a wider population than just those getting financial remuneration. Although the multiplier effect is used to describe monetary benefits, other non-monetary benefits may also accrue through the same mechanism.

Wealth distribution may occur through a variety of mechanisms. It may be through royalties or taxes paid to the government by ocean users. This, in turn, is used to the benefit of Nova Scotians by providing basic infrastructure (roads, schools etc.) and services (e.g., education, medical treatment). It is not clear, at this stage, how ESSIM can influence this.

Linkages

This sub-objective links to:

- Community well-being, particularly CWB1: *Access by coastal communities and all Nova Scotians to sustainable livelihood opportunities derived from ocean resources*; and
- EWB1: Generate wealth from the ocean by fostering new opportunities and supporting existing opportunities.

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Intrinsic value of protected species and MPAs	The intrinsic or existence value is a monetary value that people are willing to pay to preserve a species or conservation area. This may change over time, as knowledge of the benefits increase.	Research survey required	The existence value is a monetary value placed on a non-monetary benefit. It also requires technical expertise to determine.
Provincial ocean sector tax revenues and royalties/ NS government budget	Provides an indication of the contribution of the ocean-related revenues to societal requirements within Nova Scotia. It can be further split into sectors.	NS Government	How ocean-related revenues are used to benefit broader society is not detailed in an indicator such as this.
State of satisfaction	State of satisfaction of communities can be obtained through a survey methodology, possibly in the pilot communities identified in CBW2. It indicates how communities perceive the access to and distribution of wealth, and is useful to identify areas where ESSIM can have an influence.	Community Survey	This indicator deals with perceptions. The questions that are put to the communities need to be carefully developed.
Multiplier value (in pilot communities or sectors)	Provides an indication of how spending within communities adds value to the economic well-being of those communities	Research required	Multiplier values may not be readily available (for pilot communities or sectors).

Potential Problems

ESSIM can promote ocean use within the bounds of the ocean resources, but the Initiative's influence over distribution of wealth may be limited.

Code	EWB3
Human Use Element	Economic Well-Being
ESSIM Objective	To contribute to wealth generation through activities related to the ocean system and distribution according to societal objectives
Sub-Objective	Efficiency of resource use and ocean space

Definition of Sub-Objective

Wealth generation will be improved through efficient use of ocean space and resources, where the term *efficient* implies limiting costs where possible, so that net benefits increase.

Relevance to ESSIM

This sub-objective focuses on the minimization of costs associated with management and regulation of ocean uses. Management costs are those costs associated with the management of the ocean resources, and may include costs for research, monitoring and evaluation, search and rescue, control of shipping, development of ocean management plans etc. If efficient and effective systems are implemented, these costs are minimized. For instance, research could be focused on issues that require resolution and monitoring and evaluation could concentrate on areas where uncertainty exists. Additionally, development of a marine management plan in the short-term may provide long term benefits through effective planning mechanisms.

Regulatory costs are those associated with regulatory processes that may vary according to ocean use activity. For this sub-objective, regulatory costs do not include development of legislation, but rather cover costs to both government and the private sector that relate to licensing and permitting. For certain activities (e.g., offshore drilling) these costs may also include the cost of doing environmental assessments etc. ESSIM's role may be to encourage regulatory authorities to develop more efficient systems through evaluation of the current systems.

Other costs that are incurred through the use of ocean space and resources are those related to capital and operating costs of the various industries. This is linked directly to industrial capacity and assets and is discussed in ICA1: *Industrial infrastructure capacity is balanced with resource availability*.

Linkages

- Industrial capacity and assets, particularly ICA1: *Industrial infrastructure capacity is balanced with resource availability*; and
- Integrated management process.

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Costs associated with management activities (\$/activity/annum)	This indicator provides an assessment of the costs associated with various activities, the most important of which would need to be defined.	ESSIM stakeholders	This indicator does not measure the benefits of the activities, which are often hard to quantify.
Costs associated with regulatory activities as a percentage of revenue generated per sector (%)	This indicator provides an assessment of the costs associated with licensing and permitting for various sector activities, which would need to be identified.	Regulatory authorities	This indicator is limited to a sectoral evaluation.

Potential Problems

ESSIM may be able to influence other organizations to improve their management and regulatory efficiency through providing information and possibly analyses of inefficiencies. However, it will remain the responsibility of the management and regulatory authorities to implement recommendations.

Industrial Capacity and Assets

ESSIM Objective:

To support commercial activity and non-commercial uses within the bounds of resource capacity, while incorporating a culture of resource stewardship

Code	ICA1
Human Use Element	Industrial Capacity and Assets
ESSIM Objective	To support commercial activity and non-commercial uses within the bounds of resource capacity, while incorporating a culture of resource stewardship
Sub-Objective	Industrial infrastructure capacity is balanced with resource availability

Definition of Sub-Objective

This sub-objective is aimed at influencing industrial capacity for all ocean use sectors so that it does not exceed the carrying capacity or assimilative capacity of the resource. Ocean use sectors may include: fisheries, oil and gas, shipping, eco-tourism, cables, aggregate mining, maritime security and any emerging technologies.

Relevance to ESSIM

The basic rule of sustainability is that human use does not exceed the carrying capacity of the resource. Likewise, economics dictate that any commercial venture should be financially viable. The ideal situation is to find a balance of industrial capacity (inputs) with resources available (outputs).

This sub-objective is most appropriate for renewable resources, which tend to have a maximum sustainable yield below which harvesting can take place. An example is the fishing industry, which would prefer to balance the vessel capacity that it has with the allowable catch for the year. In reality the capacity often lags behind the resource availability and is difficult to manage, with over-harvesting in one year and suboptimal catches a few years later. Another example is whale watching. Too many boats may scare the whales away, which in turn negatively affects the industry.

The sub-objective is less appropriate for non-renewable resources which eventually run out, although it may still be possible to measure how quickly a resource is exhausted, or to what percent a resource is utilized. It is not appropriate when discussing the use of ocean space, which is dealt with under ICA2: *Multi-sectoral use balanced and resource use conflict decreased on the Scotian Shelf*.

ESSIM has a valuable role to play in improving the predictive capability with respect to resource availability. If greater certainty can be provided, industry will endeavor to match capacity to resource availability.

Linkages

- ICA2: *Multi-sectoral use balanced and resource use conflict decreased on the Scotian Shelf*

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Fishing fleet capacity/total allowable catch or quota (ratio)	This provides an indication of whether there is a balance between the fishing fleet capacity and amount of harvestable fish. It can be presented as a ratio or graphically as two graphs.	DFO; fisheries organizations	It may be difficult to estimate the capacity of the fleet. Capacity will have to be determined for each stock type.
Percentage licensed fishing capacity working (%)	This can be used as an alternative to the one above. If much of the fleet is not working, then there is overcapacity in the fleet.	DFO; fisheries organizations	This indicator will not be able to show the extent of under-capacity in the fleet, only that capacity is fully utilized
Cumulative production vs reserves (oil and gas; aggregates)	This indicator is used for non-renewable resources, providing an estimate of resource availability versus use over time.	CNSOPB	Reserves are not accurately known at this time and will not be without further exploration.
Percentage utilization of communication infrastructure	This indicator provides an indication of the usage of undersea cables, which are currently underutilized.	Telecommunications companies	None identified.

Potential Problems

Not all sectors have capacity that is easily quantifiable. The eco-tourism sector, for instance is a diverse sector with a multitude of activities. It is almost impossible to determine the resource capacity for say whale and bird watching. Recommended indicators are provided for those sectors that can be quantified in terms of industrial capacity and resource capacity.

Code	ICA2
Human Use Element	Industrial Capacity and Assets
ESSIM Objective	To support commercial activity and non-commercial uses within the bounds of resource capacity, while incorporating a culture of resource stewardship
Sub-Objective	Multi-sectoral use is balanced and resource use conflict decreased on the Scotian Shelf

Definition of Sub-Objective

The sub-objective is aimed at ensuring that all ocean users (of space and resources) are provided with equitable opportunity for resource use that does not conflict with other users on the Scotian Shelf.

Relevance to ESSIM

Different sectors have different resource use requirements for ocean space and resources. For instance, the telecommunications industry requires ocean floor space to run cables; shipping requires surface space to navigate; fishers require fish resources and space to fish, oil and gas industries require oil and gas resources and space to place rigs and pipelines, and the eco-tourism industry requires space for sightseeing. There is potential for a conflict between any of these sectors. Marine shipping is regulated through the international Law of the Sea (see <http://www.admiraltylawguide.com/interconv.html> for international maritime conventions). However, many sectors do not have adequate existing regulatory mechanisms to ensure minimal conflict. Multi-sectoral use of the Scotian Shelf also needs to be balanced with resource capacity and conservation requirements of the ecosystem.

A recent example of a resource use conflict is the breaking of the Hibernia telecommunications cable by a fishing trawler. Other conflicts may include marine traffic encroaching on oil rig exclusion zones, or fishers poaching in MPA no-take areas. Many of these conflicts can be limited by good communication, planning and facilitation. ESSIM is in a position to assist with these aspects.

Linkages

This sub-objective links to:

- ICA1: *Industrial infrastructure capacity is balanced with resource availability*; and
- Integrated management process.

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Sectoral footprints (area)	The size of the ecological and spatial footprint provides an indication of possible overlaps and conflicts.	Various GIS databases; sectors; DFO	Resource use footprints may be more difficult to determine, but spatial footprints will provide a simple demonstration of potential conflicts.
Number and type of conflicts or incidents (no.; quantitative description)	This provides an indication of regulatory failure and may provide information on possible gaps in the regulatory system that need addressing.	DFO; sectors	In this indicator, qualitative information may be as important as quantitative information.

Potential Problems

This sub-objective requires the co-operation of all sectors. In sectors where the rules are established (e.g., shipping), it may be more difficult to promote co-operation. In sectors where conflicts occur on a regular basis, co-operation is more likely.

Code	ICA3
Human Use Element	Industrial Capacity and Assets
ESSIM Objective	To support commercial activity and non-commercial uses within the bounds of resource capacity, while incorporating a culture of resource stewardship
Sub-Objective	Stewardship and best practices are promoted

Definition of Sub-Objective

This sub-objective aims at developing a culture of stewardship, which calls upon all ocean users to assume responsibility for protecting the integrity of ocean resources and ecosystems. Best practices are integral to stewardship and may be defined as the operational practices that are currently considered to be the most appropriate to avoid environmental degradation.

Relevance to ESSIM

Sustainable multi-sectoral use of the Scotian Shelf needs to be balanced with conservation requirements of the ecosystem if it is to continue to benefit future generations. Developing a culture of stewardship will likely lessen the impact of uses on the environment in the longer term, and eliminate current non-sustainable practices. Stewardship implies an understanding of the natural ocean system and successful stewardship is reliant on adequate capacity building and education (see CWB3: *Ocean-related education, training and awareness enhanced*).

Members of ESSIM will need to commit to best practices to improve environmental management within each sector. Obviously best practices will vary from sector to sector. An example of a best practice in the oil industry is preferential use of low toxicity, water-based drilling muds over the use of oil-based muds. In the whale watching industry, a best practice is that a viewing vessel's speed should be the same as the whale's speed or slower. The use of best practices requires personal and collective commitment, or in the absence of that, regulatory intervention. Best practice guidelines would need to be developed for each sector, if they are not currently available. There should be focus on those industries that are currently farthest from implementing best practices. These would require revision on a regular basis.

Linkages

This sub-objective is linked to:

- CWB 3: *Ocean-related education, training and awareness enhanced*; and
- Ecosystem Objectives Framework, particularly with regard to pollution and general ecosystem health.

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Number of best practice guidelines developed	Provides an indication of the commitment of various industries to a clean, healthy offshore environment.	Sectoral representatives	The indicators does not provide any information on implementation of best practices.
Amount of effluent discharged directly into the marine environment per annum by type	Provides an indication of pollution levels in the offshore.	Environment Canada	Pollution indicators may be developed under the ecosystem objectives framework. There may be little data to support this indicator.
No. of birds oiled at sea per annum	This is an indication of oil pollution levels in the offshore.	Environment Canada	Pollution indicators may be developed under the ecosystem objectives framework. There may be little data to support this indicator.

Potential Problems

This sub-objective is directly linked to ecosystem health and integrity as determined in the Ecosystem Objectives Framework. The last two indicators, which deal with pollution, may be substituted with more appropriate indicators from the Ecosystem Objectives Framework that include ecosystem health.

Integrated Management Process

ESSIM Objective:

To develop institutional arrangements and capacity, and appropriate management strategies and actions that contribute to integrated ocean management

Code	IMP1
Human Use Element	Integrated Management Process
ESSIM Objective	To develop institutional arrangements and capacities, and appropriate management strategies and actions that contribute to integrated ocean management
Sub-Objective	Collaborative planning structures with adequate capacity, which are accessible to community members

Definition of Sub-Objective/Outcome

ESSIM is intended to be a program that will require numerous organizations and stakeholders to provide inputs on a collaborative and co-operative basis (information, opinions, strategies, plans, decisions, financial, technical, administrative and human resources etc.). These organizations and stakeholders will come from Nova Scotia, elsewhere in Canada, and where relevant, internationally. They will include, amongst others: diverse government agencies (federal, provincial and local), commercial associations, individual businesses, non-government organizations (NGOs), specific communities and individuals. The outcome is envisaged as an interactive networking system of formal and informal structures within which relevant organizations and stakeholders exercise their responsibilities in the management and use of ESSIM area marine resources.

Relevance to ESSIM

The vision for the ESSIM Initiative is *"to have an effective, collaborative process that provides integrated and adaptive management plans, strategies and actions for environmental, social, cultural, economic and institutional sustainability"* DFO (2003). To achieve this vision and to make the initiative effective and collaborative there will be a need to mobilize and manage the inputs and resources from a diverse range of stakeholders, including amongst others:

- Numerous federal agencies that have mandates and responsibilities in the area (e.g., DFO, Transport Canada, Environment Canada/Canadian Wildlife Service, Canadian Environmental Assessment Agency, Natural Resources Canada; Geological Survey of Canada, National Defence - Maritime Forces, Parks Canada, Industry Canada, Royal Canadian Mounted Police, Citizenship and Immigration, Foreign Affairs and International Trade, Canada Customs and Revenue Agency, National Energy Board, Department of Justice, Canada-Nova Scotia Offshore Petroleum Board);
- Provincial agencies (e.g. Agriculture and Fisheries, Natural Resources, Petroleum Directorate, Municipal Affairs, Environment and Labour);
- Local government (e.g. Halifax Regional Municipality);
- Industry sectors and their associations (e.g. oil and gas, shipping, tourism, fishing)
- NGOs involved in natural resource management through public education and awareness activities (e.g. World Wildlife Fund for Nature - WWF, Nova Scotia Environmental Industry Association - NSEIA, Clean Nova Scotia etc.)
- Academic and scientific institutions involved in marine education and research; and
- The general public.

The inputs from all the above stakeholder categories will have to be co-ordinated and managed in a collaborative way such that high levels of synergy and collaboration are achieved. This will require dynamic interaction through a networking system of formal and informal structures. At this stage, a Collaborative Planning Model has been proposed by the Oceans and Coastal Management Division of DFO (BLSmith Groupwork Inc. 2004). This will be implemented by ESSIM once it has been approved by stakeholders.

Linkages

This sub-objective has links to all of the ESSIM sub-objectives as it forms the core of ESSIM.

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Audited budgetary expenditure for operating formal ESSIM management structures (\$/annum)	Audited budgetary expenditure will provide evidence, as well as a measure of, ESSIM formal networking activities.	Federal budget records	Audited records are slow in being produced.
Budget allocations made by ESSIM stakeholders in order to participate in ESSIM management structures (\$/annum)	Budget allocations to ESSIM activities by stakeholders provides evidence of their commitment to the Program and Plan	ESSIM participants	It might be difficult to obtain a total picture of this as participants might be unwilling or unable to provide data.
Number of personnel hours allocated by collaborating parties for ESSIM activities (hours/annum)	Designation of human resource time to ESSIM activities by stakeholders provides evidence of their commitment to and involvement in the Program and Plan	ESSIM participants	It might be difficult to obtain a total picture of this, as participants might be unwilling or unable to provide data.
Extent of participation in formal ESSIM activities	Records of formal and informal meetings including attendance provide a measure of participation and level of networking activity.	ESSIM Planning Office	None identified.
Presence of a stakeholder register and database which also outlines ESSIM responsibilities and involvement	The availability of a register and database with numbers of individuals and organizations provides a measure of the stakeholders who form part of the ESSIM network. This should also include categories and designations.	ESSIM Planning Office	Most registers and databases require considerable maintenance and updating as the record, particularly for individuals, is continually changing.
Number of key decisions that are made by ESSIM structures (no.)	The effectiveness of ESSIM will depend on the number of formal decisions that are made that relate to the marine resources.	ESSIM Planning Office	None identified.

Potential Problems

With such a wide and diverse range of stakeholders there could be problems in ensuring that the management system is able to accommodate complete stakeholder representation as there are a large number of organisations (as well as their most appropriate representatives) that will need to be involved in formal negotiations and decisions. It may also be difficult to reach decisions and ensure that actions are taken within the ESSIM structure. It requires commitment on the part of all parties.

Code	IMP2
Human Use Element	Integrated Management Process
ESSIM Objective	To develop institutional arrangements and capacities, and appropriate management strategies and actions that contribute to integrated ocean management
Sub-Objective	Policies, plans, programs and measures applicable to ocean users

Definition of Sub-Objective

In view of the numerous sectors and resources that are relevant within the ESSIM area, there will be a need for all the respective parties to have a clear understanding of how ESSIM will operate and how this will affect their own activities. Consequently the outcome of this objective will be the availability of a series of stakeholder-developed documents that explain how marine resources within the ESSIM area will be managed and how respective stakeholders are expected to carry out their activities. These will include documents on policy, planning, guidelines and relevant regulations and practices.

Relevance to ESSIM

A co-operative collaborative management system such as ESSIM requires that a wide range of documentation be developed and made available for application by stakeholders. These include:

- Policies that outline the desired approach as to how the marine resources are to be managed based on the opinions and desires of wider society;
- Strategies that outline how these policies can be implemented;
- Programs that detail implementation actions, responsibilities and time frames; and
- Guidelines and practices as to how specific resources are to be managed and procedures that should be followed by the relevant sectors and stakeholders.

Some relevant policies, strategies, programs and guidelines have already been prepared and are being applied, but in an unco-ordinated way through separate agencies, under different mandates. The envisaged outcome is for ESSIM to co-ordinate this by undertaking a process of review to confirm the continued relevance of the existing ones and identify gaps for those that will need to be prepared.

Linkages

This sub-objective has links to all of the ESSIM sub-objectives as it forms the core of ESSIM.

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Presence of the ESSIM Plan	A plan should consist of a detailed statement on what needs to be done, what resources are to be allocated, responsibilities and time schedule for actions to be completed.	ESSIM Secretariat files	There will be difficulty in finalising a document that is agreed on by all parties.
Policies and programs relevant to ESSIM	There will be a need to review all relevant policies and programs that pertain to the management of the ESSIM area, based on the spectrum of stakeholders.	Government institutions	This is a quantitative indicator that may not change appreciably every year.
Presence of operational guidelines and practices for each of the user sectors	Each of the stakeholder sectors will require operational guidelines which detail practices that apply to the management of the relevant resource.	ESSIM Secretariat	None identified.
A checklist of required documents that apply to ESSIM management	There will be many documents that will be needed to direct ESSIM's envisaged integrated management process. A checklist might be a useful form of monitoring availability and status.	ESSIM Secretariat files	None identified.

Potential Problems

Most of the indicators relate to the presence or absence of recognised documents that guide and direct the ESSIM process. Progress and status for each one is therefore an all or nothing situation. An integrated index such as the "checklist" is probably the best indicator for this.

Although it would be appropriate to have indicators that relate to implementation, these can only be developed once the plans, programs, policies and guidelines are in place.

Code	IMP3
Human Use Element	Integrated Management Process
ESSIM Objective	To develop institutional arrangements and capacities, and appropriate management strategies and actions that contribute to integrated ocean management
Sub-Objective	Legal principles (international, federal and provincial) and responsibilities implemented

Definition of Sub-Objective

The Scotian Shelf is subject to the application of numerous legislated principles and responsibilities (e.g. through the *Law of the Sea*; *Convention on Biological Diversity*; *Fisheries Act*; *Canada-Nova Scotia Petroleum Resources Accord Implementation Act*). The outcome of this objective is, therefore, to ensure that within the ESSIM area, all applicable legal principles and responsibilities are evaluated and applied.

Relevance to ESSIM

There are a wide range of international, federal, provincial and local legislated principles and practices that apply to the ESSIM area. These relate to a wide variety of issues such as climate change, biodiversity and the conservation of species at risk, responsible fisheries, straddling and highly migratory fish stocks, environmental protection from land based activities, ship safety, occupational safety, environmental assessment and pollution prevention from ships.

International environmental legislation alone includes, among others: *United Nations Framework Convention on Climate Change*; *Convention on Biological Diversity*; *Law of the Sea*; *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention)*; and the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal*. Likewise, federal environmental legislation includes, among others: *Oceans Act*, *Fisheries Act*, *Species at Risk Act*; and the *Canada Environmental Assessment Act* and provincial environmental legislation includes the *Environment Act* and the *Water Resources Act*. Thus, there are numerous legislative instruments which apply to the human use and management of resources in the ESSIM area. The inclusion of relevant legal principles into all legislation that is applicable to the ESSIM area is a key consideration for the long-term management of the area.

In addition, all of the stakeholder government agencies have legislated mandates, which are applicable in some way, and in varying degrees, to the management of the ESSIM area. It is important that the mandates of these agencies and their responsibilities related to ESSIM are clearly elaborated and understood by all stakeholders.

Linkages

This sub-objective is linked to:

- CWB1: *Access by coastal communities and all Nova Scotians to sustainable livelihood opportunities derived from ocean resources*
- IMP4: *Ocean user compliance with the ESSIM Plan and regulator accountability toward the Plan*

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
A published review of applicable legislation for ESSIM area	There will be a need to do a gap analysis review of all relevant legislation to assess any missing legal principles.	Legal archives	This an initial indicator which will require follow up after a period of time.
Number of newly introduced legislative directives per annum that apply to ESSIM users (no.)	ESSIM management will probably lead to the production of new legislation and directives pertinent to specific users. This indicator measures this.	Parliamentary records, both federal and provincial	None identified.
Number of newly introduced legislative directives per annum that apply to ESSIM regulators (no.)	ESSIM management will probably lead to the production of new legislation and directives pertinent to specific government agencies. This indicator measures this.	Parliamentary records, both federal and provincial	None identified.
Resources and activities that arise as a result of newly introduced directives	Following the promulgation of new legislation there are always activities and resources that have to be mobilised in order for these to be applied by the responsible institutions. This indicator provides an assessment of this.	Budgets and records of affected agencies	It will be difficult to quantify the resources and activities as these have many dimensions (technical equipment, personnel, financing, systems etc.).

Potential Problems

Development and introduction of new legislation or changes to existing legislation requires a complex and involved political process that will be outside of ESSIM's control. ESSIM will require considerable political involvement and support in order to be effective.

In addition, the timing between the political decision and the allocation of resources or reaction by agencies can be lengthy. ESSIM should strive to ensure that there are minimal delays in implementation of politically-approved directives.

Code	IMP4
Human Use Element	Integrated Management Process
ESSIM Objective	To develop institutional arrangements and capacities, and appropriate management strategies and actions that contribute to integrated ocean management
Sub-Objective	Ocean user compliance with the ESSIM Plan and regulator accountability toward the Plan

Definition of Sub-Objective

Within the ESSIM Plan, there will be many operational aspects that require compliance and accountability in order to achieve effective integrated ocean management. The outcome will, therefore, be a system and process that ensures compliance and accountability by both users and regulating agencies, based on agreed and applicable elements within the ESSIM Plan. It is envisaged that it includes a system of monitoring and reporting both on the state of resources in the marine environment as well as the compliance by users and performance of regulators in implementing the ESSIM Plan.

Relevance to ESSIM

The achievement of effective integrated marine management within the ESSIM context will depend on:

- Achieving a high level of commitment from relevant regulatory agencies based on their legal and institutional mandates; Securing a high level of voluntary compliance from users;
- A clear outlining of roles and responsibilities; and
- A monitoring system that is able to assess whether there has been compliance and commitment from both users and regulators.

The extent of compliance achievement in both the user and regulatory sectors will be, to a large extent, a reflection of the overall success of ESSIM. It would mean that all parties have fully understood the situation regarding their roles and responsibilities, and responded accordingly.

Linkages

This sub-objective links to most other sub-objectives as it is a reflection of how well stakeholders have responded to other sub-objectives. Particular links include:

- CWB 3: *Ocean-related education, training and awareness enhanced;*
- EWB3: *Efficiency of resource use and ocean space;*
- ICA3: *Stewardship and best practices are promoted;*
- IMP1: *Collaborative planning structures with adequate capacity, which are accessible to community members; and*
- IMP2: *Policies, plans, programs and measures applicable to ocean users.*

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Number of officially reported incidences of non-compliance per annum (no.)	These are incidents or requests that are officially recorded, and reacted on, by the respective agencies responsible for administering a particular resource or practice.	Agency records, ESSIM Secretariat files	Data may not be easily accessible.
Number of successful prosecutions per annum (no.)	These are the number of prosecutions that lead to conviction or penalties to parties who transgress ESSIM-related regulations	Court records	Data may not be easily accessible.
Number of "unofficial" incidences of non-compliance per annum (no.)	These are the number of incidences of non-compliance that are reported by other parties within the ESSIM network, and not able to be followed up by agencies.	ESSIM Planning Office	There is always reticence by parties to be branded as "whistleblowers", therefore unofficial citings will be limited.
Presence of a monitoring and reporting system	This is a monitoring and reporting system on compliance which is maintained by the ESSIM Planning Office.	ESSIM Planning Office	

Potential Problems

There will be a resistance from stakeholders, both users and regulators, for ESSIM to act as a monitoring system, which provides information on non-compliance in a truly transparent way.

Code	IMP5
Human Use Element	Integrated Management Process
ESSIM Objective	To develop institutional arrangements and capacities, and appropriate management strategies and actions that contribute to integrated ocean management
Sub-Objective	An effective communication system by which the public and stakeholders are made aware of, and are able to understand, ESSIM in terms of decisions, activities and implications

Definition of Sub-Objective

Because the ESSIM Initiative is a collaborative approach to the management of marine resources, it is important that there is transparency in the activities of the program and that the public and stakeholders are able to observe and understand the ESSIM process. The outcome is, therefore, the presence of an effective communication system by which the public and stakeholders are made aware of, and are able to understand, ESSIM in terms of the decisions made, activities undertaken and societal implications.

Relevance to ESSIM

The key ingredient for achieving collaboration and co-operation is transparency and the free flow of relevant and unbiased information to stakeholders. The presence of an effective communication system will provide the following outcomes and impacts:

- Improved understanding of the situation regarding the marine environment and its resources;
- Improved understanding of the role of ESSIM in facilitating the process of achieving integrated and sustainable marine resource management;
- Improved understanding of the activities and impacts of certain sectors on marine resources;
- A synergistic involvement of stakeholders in ESSIM activities; and
- Informed policy and decision-making by all parties

The communication system will need to cover a multiplicity of areas and issues, some of which include:

- Public awareness on marine issues through normal communication channels, such as newspaper, radio, Website and TV;
- Involvement of academic institutions (schools and universities) in the generation and use of information;
- Specific communications to targeted personnel in stakeholder organisations and institutions;
- Provision of a service to stakeholders and parties who seek information on ESSIM;
- Publication and dissemination of all documents on policy, planning, guidelines and practices;
- Monitoring of information sources relevant to ESSIM;
- Support of research on ESSIM management issues; and
- Promotional material on users, agencies and parties who participate in the ESSIM Program.

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Presence of a Communication Strategy and Program	This should outline who and how information will be collected and disseminated.	ESSIM Planning Office	None identified.
Numbers of stakeholders who receive and read an ESSIM general newsletter (no./issue)	ESSIM should have a regular "flagship" newsletter which informs stakeholders about ESSIM matters. This should be monitored according to circulation numbers, or website hits per issue.	ESSIM Planning Office	This indicator does not show whether the newsletter gets read or understood.
Number of official radio and TV, website announcements related to ESSIM activities (no./annum)	The electronic media provides a rapid way of disseminating information to a wide range of stakeholders via formal communiqués. These formal communiqués can be monitored.	ESSIM Planning Office	Media releases can only provide limited coverage of any issue at one time.

Linkages

This sub-objective links to:

CWB3: *Ocean-related education, training and awareness enhanced;*

Potential Problems

Communication issues are always a difficult problem as not all parties wish to see information disseminated, or at the very least, wish to approve and selectively modify the information.

Code	IMP6
Human Use Element	Integrated Management Process
ESSIM Objective	To develop institutional arrangements and capacities, and appropriate management strategies and actions that contribute to integrated ocean management
Sub-Objective	Adaptive management in response to change

Definition of Sub-Objective

In the development and implementation of any program and plan, it is often found that policies and practices need to be revised or changed according to situations that arise intentionally or unintentionally. It is important that the ESSIM process has the ability to rapidly evaluate and incorporate the consequences of these changes into its methods of operation. The outcome of this sub-objective is the presence of a management system that is continually evaluating the multi-dimensional aspects of the ESSIM marine area, and adjusting policies, plans, guidelines and practices to meet the demands created by such changes.

Relevance to ESSIM

ESSIM is comprised of a multi-stakeholder management system and process that has to cater for situations or events that:

- Arise intentionally because they form part of policy and practice (e.g., the introduction of a new directive that limits access to fishery resources) and lead to a changed circumstances regarding the status and management of a particular resource; or
- Arise unintentionally because of unforeseen circumstances (e.g., a hurricane or a marine disaster).

In both cases, the ESSIM management system must be able to, in a timely manner, assess the situation and make decisions that are logical and acceptable to stakeholders. The ESSIM process will have to have the capability of responding rapidly, particularly in the case of the latter category of situations and events which might require decisions and reaction to be made within hours or days.

Another component of adaptive management is the need for research and monitoring. Research may include non-directed research that contributes to the general understanding of system functioning (ecosystem or human use system), or it may be directed research aimed at solving a particular problem or monitoring to decrease uncertainty. In either case, ESSIM needs to have the capability to harness the knowledge generated and incorporate it in future decisions.

Linkages

This sub-objective relates to all other sub-objectives as adaptive management is the foundation of the ESSIM management system.

Recommended Outcome Indicators

Indicator	Meaning	Possible Data Sources	Shortcomings
Number of regular formal reviews undertaken to assess ESSIM (no./annum)	Regular reviews will be required to ensure a culture of adaptive management in ESSIM.	ESSIM Planning Office	None identified.
Number of changes to the plan that are made in response to formal review of ESSIM (no./annum)	Provides an indication of substantive changes to the Plan that will influence activities and processes within ESSIM, from formal review processes.	ESSIM Planning Office	It may be preferable to use a qualitative indicator.
Number of changes to the plan that are introduced in response to unforeseen circumstances (no./annum)	Provides an indication of substantive changes to the Plan that will influence activities and processes within ESSIM, due to unforeseen circumstances.	ESSIM Planning Office	It may be preferable to use a qualitative indicator.
Number and budget of research projects in the ESSIM area by subject (no. and \$/annum)	Provides an indication of the research effort occurring in the ESSIM area that could feed into the adaptive management process.	Universities and research institutes	It may not be possible to identify all research projects, and information on budgets may not be readily available

Potential Problems

Adaptive management is a concept that is fairly difficult to measure quantitatively, and may have to rely on qualitative assessment of the success of responses to changing circumstances.

References

Anielski, M., M. Winfield and Pembina Institute. 2002. A Conceptual Framework for Monitoring Municipal and Community Sustainability in Canada. Prepared for Environment Canada. Pembina Institute, Ottawa. 130 pp.

BLSmith Groupwork Inc. 2004. Eastern Scotian Shelf Integrated Management Initiative: Proposed Collaborative Planning Model – A Discussion Paper. Prepared for: Oceans and Coastal Management Division, DFO, Dartmouth. 22 pp.

Barbière, J. (Ed). 2003. A Reference Guide on the Use of Indicators for Integrated Coastal Management. ICAM Dossier I, IOC Manuals and Guides No. 45. 126 pp.

Charles A, Boyd H, Lavers A and Benjamin C. 2002. The Nova Scotia GPI Fisheries and Marine Environment Accounts: A Preliminary Set of Ecological Indicators of Ecological, Socioeconomic and Institutional Indicators for Nova Scotia's Fisheries and Marine Environment. GPI Atlantic, Halifax.

Fisheries and Oceans Canada (DFO). 2003. A Strategic Planning Framework for the Eastern Scotian Shelf Ocean Management Plan: A Discussion Paper Prepared for the ESSIM Forum. DFO, Dartmouth. 37 pp.

Fisheries and Oceans Canada (DFO) and Department of Fisheries and Aquaculture, Government of Newfoundland and Labrador (DFA). 2004. Federal-Provincial-Territorial Coastal and Ocean Indicators in Support of the Integrated Management of the Oceans. DFO, Ottawa. 39 pp.

